

TECHNOLOGY

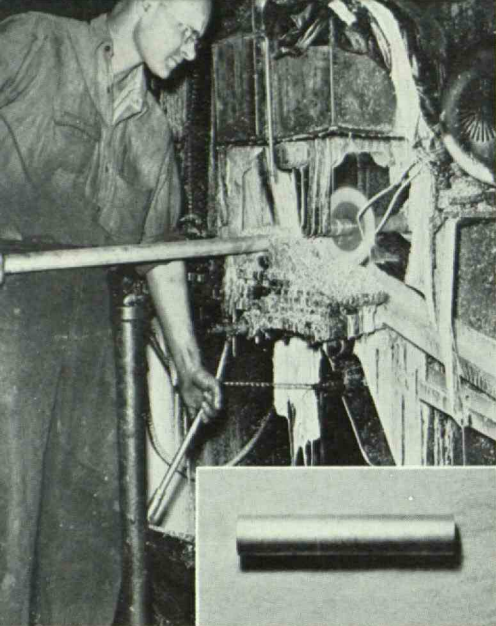
REVIEW *February* 1949



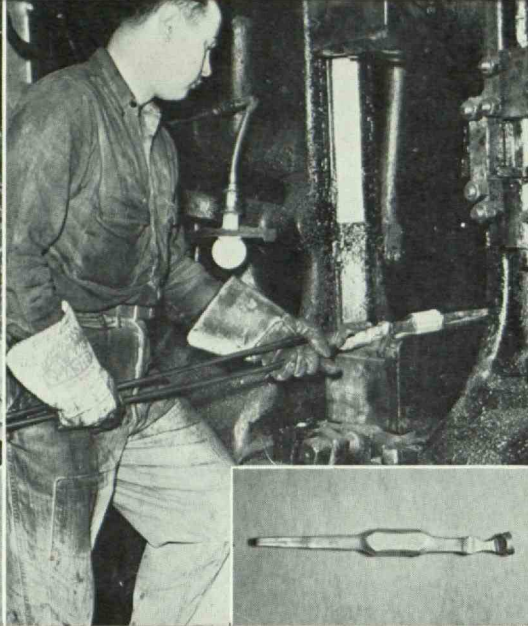
technology review

Published by MIT

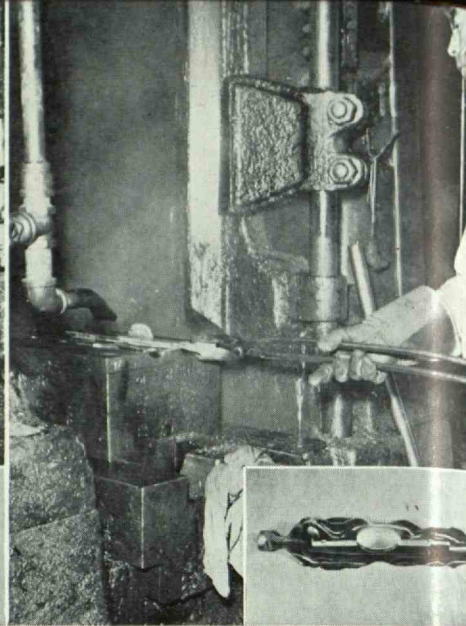
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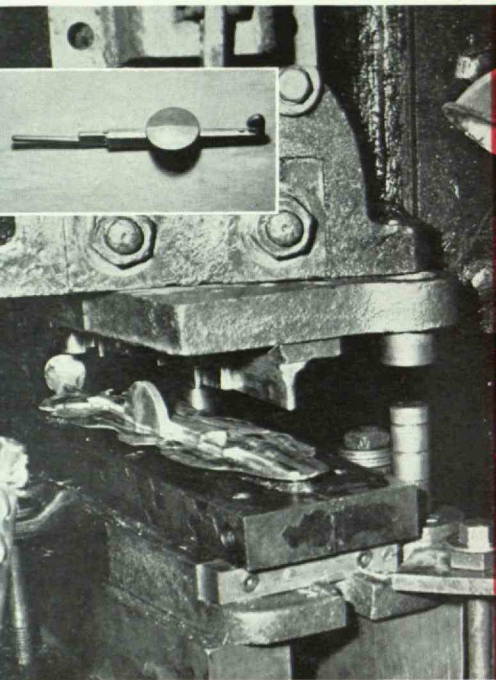
Cutting Bar



Lengthening and Shaping



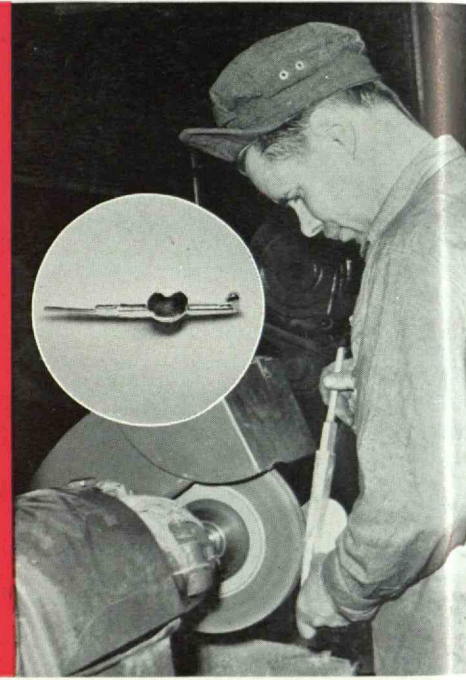
Shaping to the Die



Trimming the Flash

FORGING ALUMINUM

into
Pressure Cooker Tops



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MACHINING FACILITIES

Industrial Eye Accident Costs Up 78½%*

*SINCE 1939

FIRST AID

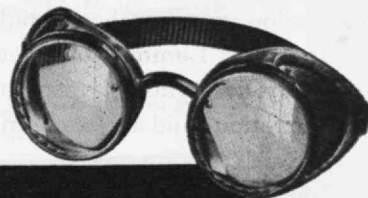


Here's One Expense Cost-Conscious Management has cut — to Rock Bottom in these Days of Rising Costs

Year after year, industrial eye accidents embezzle your profits and cut your production by sidelining able men, putting machines in the hands of less experienced workers, lowering morale, hiking claims and insurance costs. All this on top of the cost of medical service!

Aware that 98% of industrial eye accidents are preventable, many companies have solved this problem by installing an adequate eye protection program with results

like this: cost of eye accidents in year prior to program, \$4,262.00; cost of eye accidents in first year of program, \$204.59! Ask your AO Safety Representative how an AO Eye Protection Program can cut your costs.

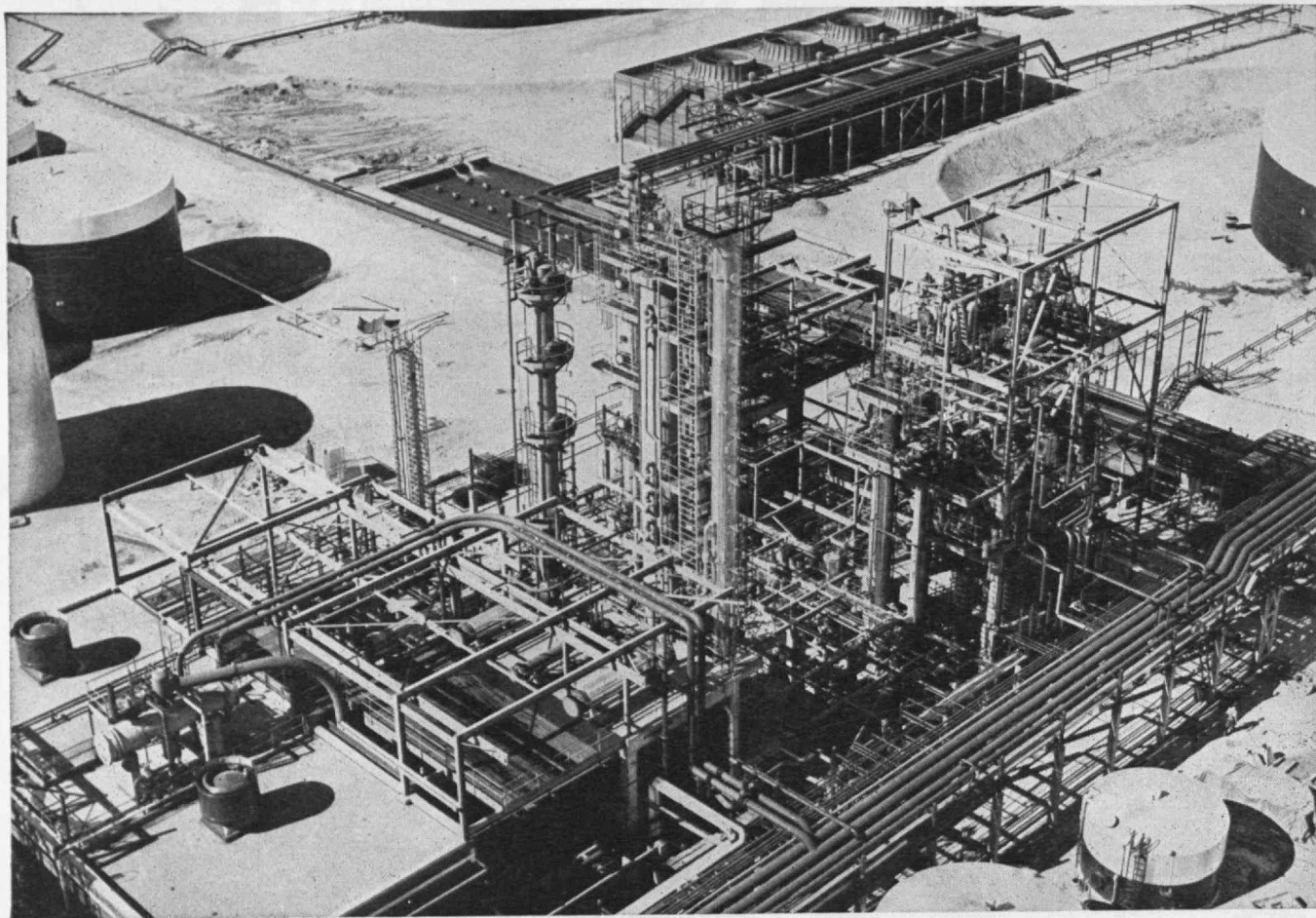


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Division*

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...an interesting example of integrated expansion

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The catalytic cracking unit was part of an integrated expansion program that included the design and construction by Lummus of three other new units—gas recovery, catalytic polymerization, liquid propane gas fractionation—and the modernization by Lummus of a thermal cracking unit.


Continental's Denver Program is an interesting example of refinery expansion accomplished by integrating new units with modernized existing facilities. This program practically doubles the crude thruput at Denver and raises the octane level of the finished gasoline.

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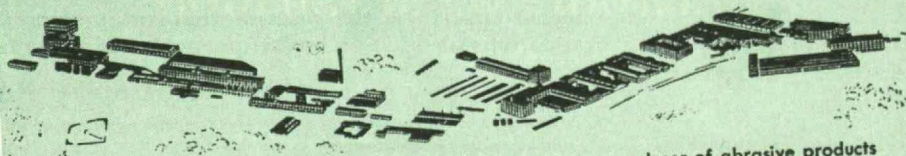
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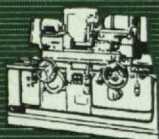
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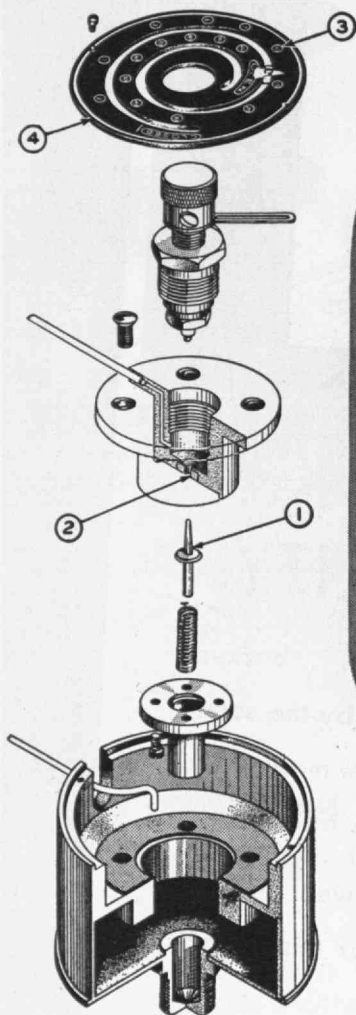
(Behr-Manning, Troy, N. Y. is a Norton Division)



Mason-Neilan Offers

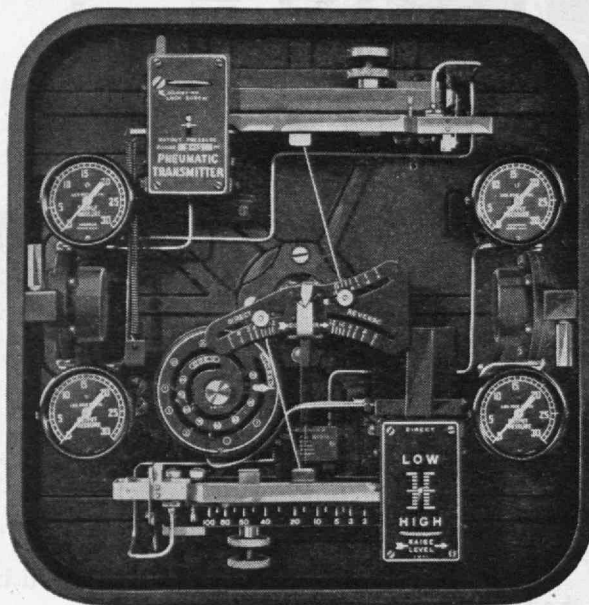
INTEGRAL RESET

in the 12,000 Series Level Controllers

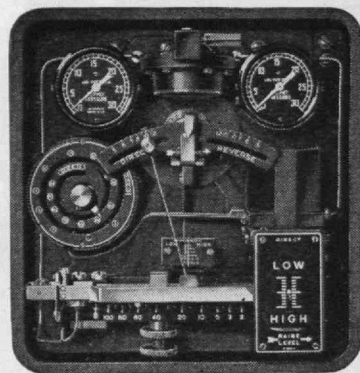


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Model 12610-20 Proportional-Reset Controller and Pneumatic Transmitter



Model 12610 Proportional-Reset Controller



Model 12610 Controller

Masoneilan proportional-reset level controllers have the entire reset mechanism *inside* the instrument case.

Reset is thus accessible, compact and protected.

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There are no external connections or adjustments to make. There is no external piping. And since the reset is an integral part of the controller and not an external appliance, the reset mechanism is always accurately calibrated, with graduations on a ten-inch scale proportional to actual reset rates.

When to Specify Reset . . .

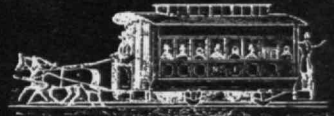
1. When you want to get maximum vessel surge capacity at all times and in the presence of large and sustained load changes.
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3. When the level controller pneumatically sets the set point of a flow controller, or of several flow controllers in split-stream operation.

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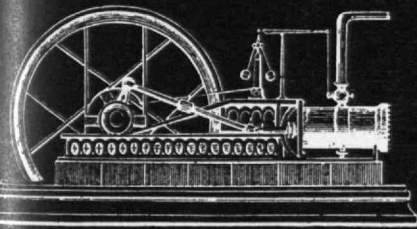
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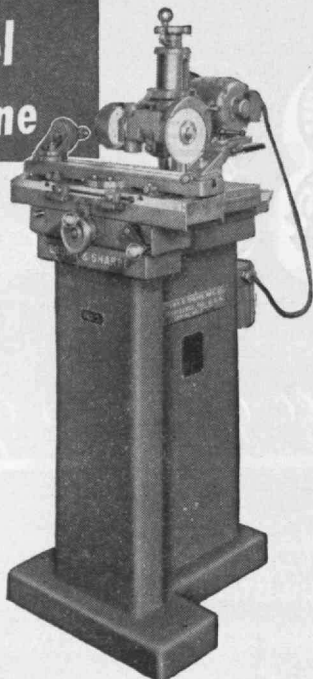


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THE TABULAR VIEW

He flies through the air bent on achieving the most rapid transportation possible, yet the typical air passenger seldom gives thought to safety until tragic crashes come to his attention. The case of safety in the air is ably and authoritatively presented in the personal opinions (page 215) of W. MACK ANGAS, '17, Rear Admiral, director of the Atlantic Division of the Bureau of Yards and Docks, Civil Engineer Corps, United States Navy, and Lieutenant Commander WILLIAM T. HARDAKER, Naval Air Technical Training Command, Memphis. Although not expressing official Navy views, both officers have had extensive experience in flying, and in airport design and construction for the Navy. Admiral Angas is already favorably known to Review readers for his articles on maritime matters. As one of its new authors, The Review welcomes Commander Hardaker who has flown more than 2,700 hours since getting his wings in 1939, mostly in the Central, South, and Southwest Pacific during the first 18 months of World War II.

With the greatest of ease and with good (if misguided) intentions, large numbers of this nation's agriculturalists have contributed to destruction of this country's topsoil. The problem of soil conservation is gradually becoming recognized as a major factor in providing a food supply for the world's steadily growing population. In this issue (page 221) EDWARD H. GRAHAM outlines some of the projects now in progress to conserve soil, and indicates the extent to which engineering is necessary in this program. Dr. Graham is a graduate of the University of Pittsburgh (B.S., 1927; Ph.D., 1932), and for several years was associated with the Carnegie Museum in Pittsburgh as assistant curator of botany. Since 1937 he has been with the United States Department of Agriculture where he is now chief of the Biology Division of the Soil Conservation Service.

The daring young man who, palette in hand, appears to daub undecipherable patches of oil on canvas, may have a message for the conventionalists after all. PAUL MEADOWS turns to their writings for an interpretation (page 220) of the work of the contemporary rebel painters. Dr. Meadows, Associate Professor of Sociology at the University of Nebraska, has been an avid student of social movements and the human aspects of modern industrialism for many years, as his articles in The Review testify.

On the flying trapeze of easy money for mathematical accomplishment, many an abecedarian, and occasionally a scholar, has come to grief. Attracted by prizes which have been offered, many tackle problems beyond their ability for utilitarian reasons, as WILLY LEY points out (page 225). Mr. Ley, an Editorial Associate of The Review, for the past five years, is probably best known for his writings on matters pertaining to rockets. He also delves into other aspects of science writing, including a number of books, of which his latest is *The Lungfish, the Dodo, and the Unicorn*.

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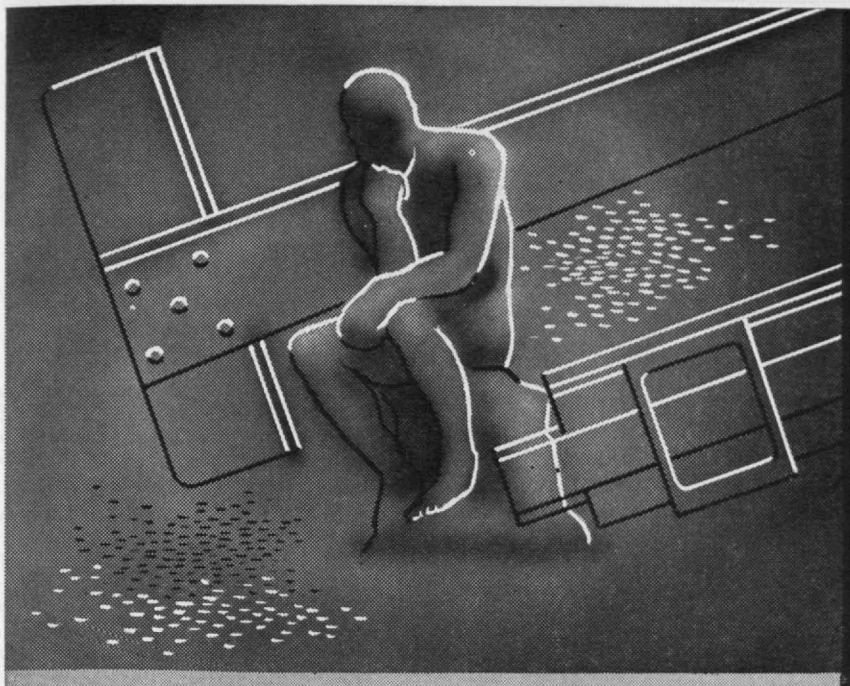
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MAIL RETURNS

Continental Contributors

FROM LLOYD ESPENSCHIED:

Permit an outsider to express his appreciation of the article on Ampère in the December, 1948, issue of The Review, written by David and Charlotte B. Landau. It's a beautiful picture of the times, the man and his accomplishments; an appropriate recognition of one of the greatest of electrical scientists.

Such an article should be relished the more because we in the United States are none too well informed on the Continental contributors to electricity and magnetism, the result, apparently, of the language barrier, of the fact that the Continental contributors were divided between a number of nationals, and perhaps have been lacking in publicity sponsors, certainly in the English language, compared to the British.

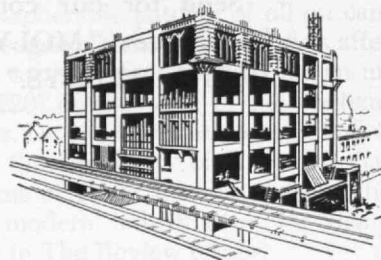
Before me is Ampère's book of 1822, *Recueil d'Observations Electro-Dynamiques*. The contents of it are well summarized in the international language of the 10 plates of figures. Here we see some of the earliest illustrations of the electrical conductor wound up into a coil* to enhance the magnetic effect; long, thin coils, short, fat coils (pancake coils), and single loops mounted delicately on pivots and capable of rotary displacement and thus showing mechanically the inductive action between two circuits carrying current. Here we see some of the carefully constructed apparatus with which Ampère determined some of the primary laws of electromagnetism, measured the interaction as a function of distance and angle between coils, which he then expressed mathematically.

Perhaps our conception of his contribution would be clarified if, instead of using the term "electrodynamics," which has little currency today, we simply said that following Oersted's discovery, it was Ampère who first elucidated electromagnetism and supplied the primary knowledge of electromagnetic-mechanical action. He was the

* The simple but basic contribution of wrapping a wire up into a coil, and thus "multiplying" the effect of a single wire, Ampère shares in the year 1820 with Schweigger of Halle who originated the galvanometer.

(Concluded on page 242)

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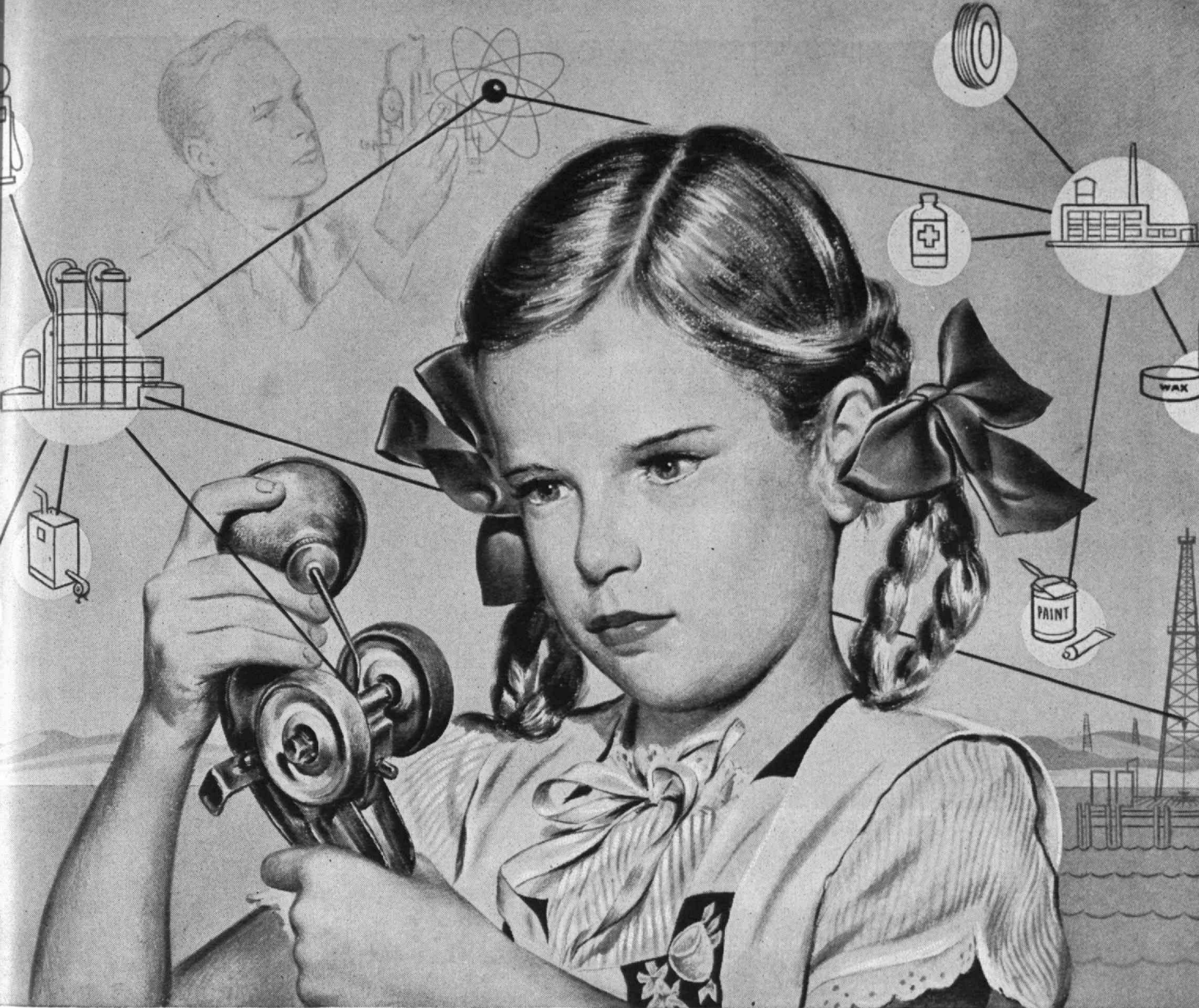
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Liquid coal —the Oil of the Future

Petroleum has been aptly called "strategic mineral Number One in world affairs." Yet proved oil reserves, particularly in the United States, are alarmingly low. Experts may differ as to when the earth's crust will yield its last barrel, but none denies the seriousness of the problem posed by rate of consumption vs. known reserves.

Fortunately, there are alternative sources—almost unbelievably abundant—from which modern alchemy can synthesize petroleum products. These, principally, are coal, natural gas and oil shale—our major carbon deposits.

Coal, by its abundance, is the hope of the future. Known beds could provide America's oil needs for a thousand years. But coal is presently more difficult and costly to convert to oil than natural gas, of which there is a supply about equal to our petroleum reserves. Shale, at the present stage of development, has practical possibilities mainly

as a source of heavy fuel oil and Diesel fuel.

Plants for the conversion on a commercial scale of all three basic materials are under way, after successful laboratory and pilot plant tests. Natural gas appears at present to be the one source from which synthetic oil can compete on equal terms with petroleum. With major oil company backing, both the Texas and Kansas gas fields are being utilized.

To this important program, Combustion Engineering is contributing its vast experience in the fields of fuel burning, steam generation (both natural and forced circulation), heat transfer and fluid flow. C-E equipment now being built for natural gas synthesis plants includes steam generating units, separately fired superheaters, gas generators and catalyst reactors. Here, as on other industrial frontiers, you will find the C-E flame—symbolizing Combustion's part in the better utilization of heat. B-236



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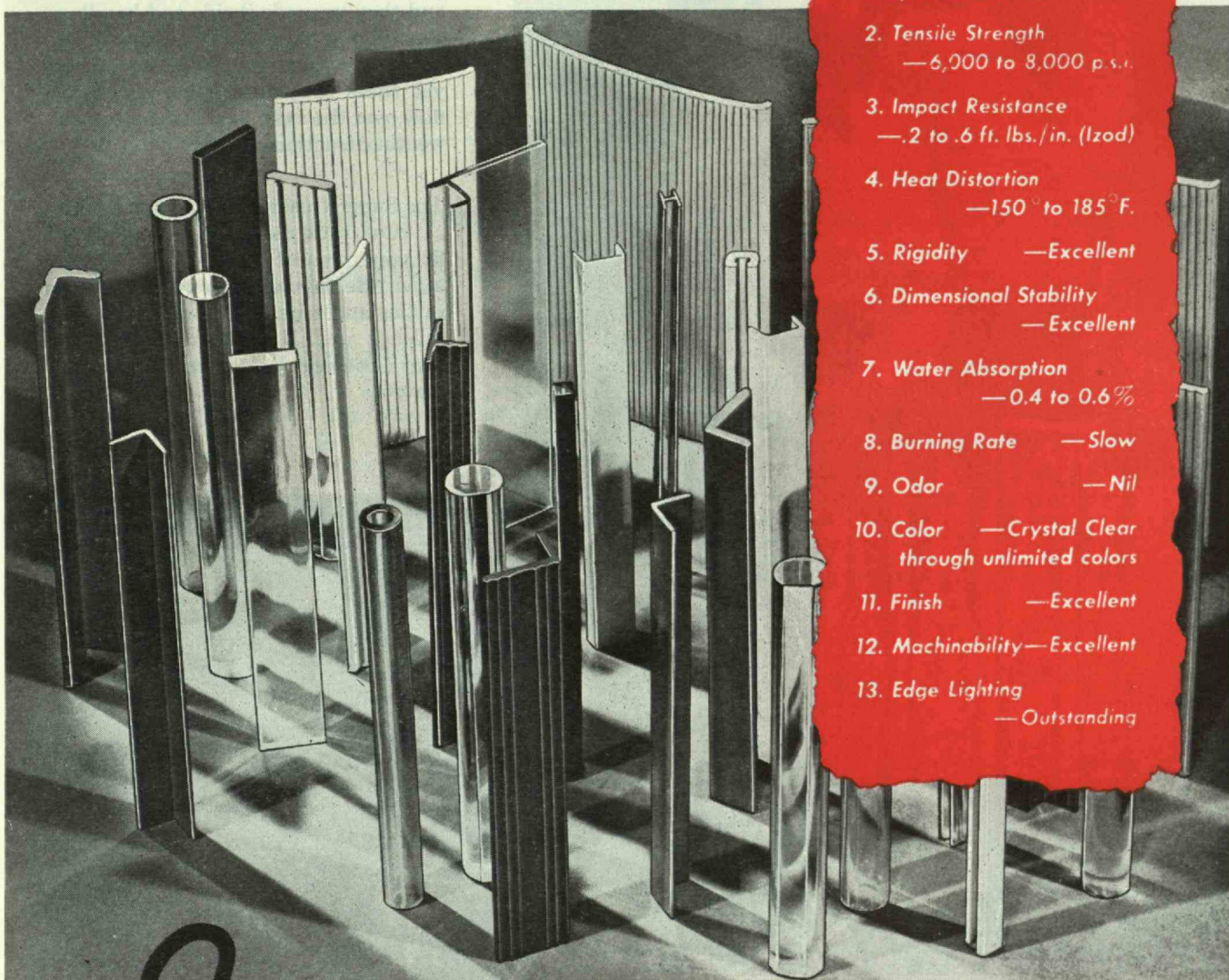
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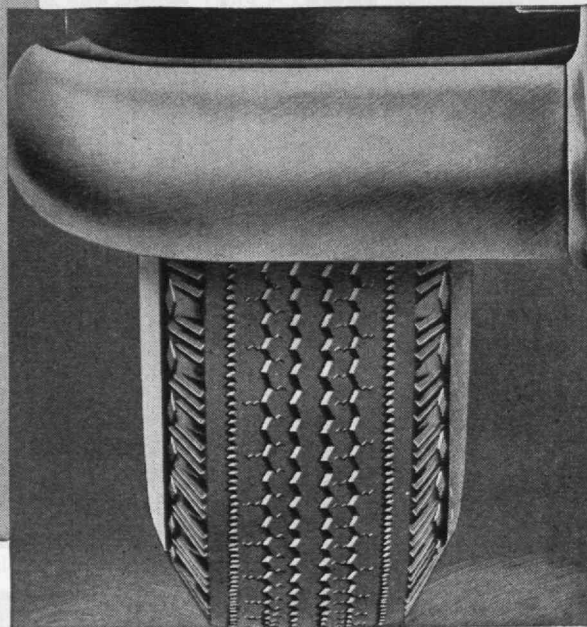


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Paul McC. Wiswall, '09

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Taylor and Dull from Black Star

Descent of Man

THE TECHNOLOGY REVIEW

Vol. 51, No. 4



February, 1949

The Trend of Affairs

Big Sleep

Most living things periodically enter a phase of dormancy, such as sleep. Human beings spend some third of their lives asleep. During sleep a depression of tissue and organ activity occurs, together with diminished muscle tone, slowed circulation and respiration, a lowered metabolic rate, and a drop in body temperature. Furthermore, during the sleeping hours, people go without food considerably longer than they ordinarily do while awake. Sleep is absolutely essential to man and to all other animals; animals may, in fact, be killed by merely keeping them awake for several days and nights in succession.

Certain mammals, and also particular species of fish and amphibians, pass the winter by hibernating. Hibernation is essentially profound and prolonged sleep; and the bodily changes occurring during hibernation are similar to those just described, but more pronounced in degree. In the tropics, some animals estivate; estivation is the seasonal converse of hibernation, in which the summer is spent in torpor.

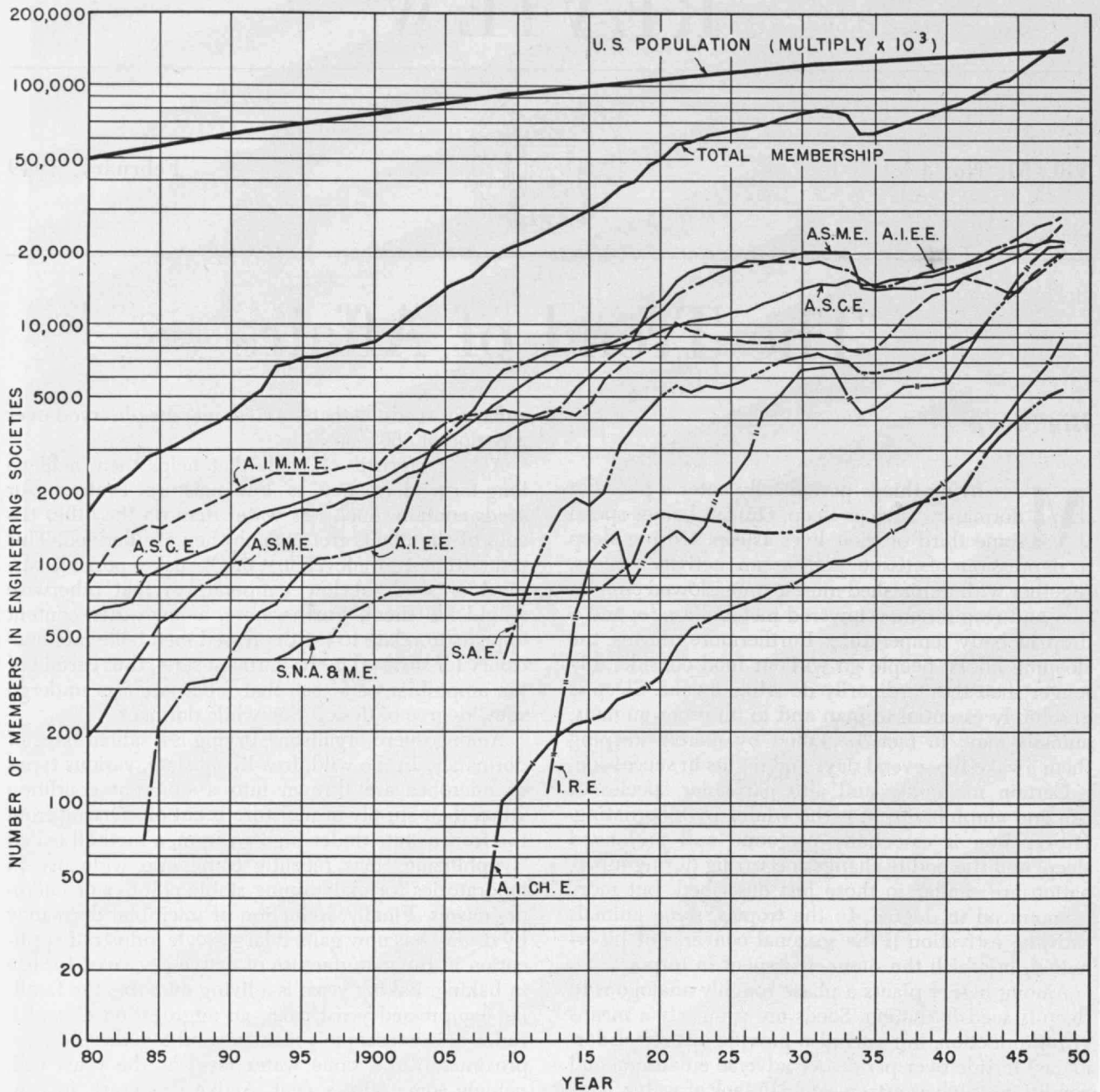
Among higher plants a phase roughly analogous to sleep is seed formation. Seeds are primarily a means of reproduction, but they also provide a stage of dormancy to tide over periods of adverse environmental conditions, such as extreme cold or lack of water. Normally seeds germinate within a year of the time they are produced, but often are capable of retaining the spark of life for extraordinarily long periods. Thus a recently completed study of English wheat seeds, stored in sealed glass tubes, showed that after 32 years 69 per cent of the seeds were still capable of sprouting. This study was then terminated because the samples were exhausted, but the authors concluded that extrapolation of the curve of viability indicates some of the wheat seeds would still have been alive at the end of 50 years. Similar research now under way at a West Coast university has been planned to provide

sufficient seeds so that survival may be observed over a period of 360 years.

A characteristic of seeds that helps them achieve long-term dormancy is low-moisture content, for seeds contain much less water than do the other tissues of the plants from which they are derived. This reduced moisture level, first of all, makes possible survival of seeds at low temperatures that otherwise would kill them. Furthermore, a low-water content appears to relate to the depressed metabolic rate necessary for survival in the dormant state; thus certain of the amphibians and fish that hibernate also undergo some degree of desiccation while dormant.

Among micro-organisms, drying is a salient basis of dormancy. In the wild, free-living state, various types of microbes are thrown into a dormant condition when their supply of moisture is cut off. Drying from the frozen state under high vacuum, a method called "lyophilizing," has recently come into wide use in laboratories for maintaining stable cultures of micro-organisms. Finally, induction of microbial dormancy by drying has now gained large-scale industrial application in the manufacture of active dry yeast for use in baking. Baking yeast is a living microbe; the familiar compressed yeast cake, an aggregation of multitudes of microscopic yeasts pressed together, has approximately the same water level as the yeast cell, namely some 60 per cent. Active dry yeast, in contrast, is living yeast in the form of dry granules with a moisture content in the neighborhood of only seven per cent. The active dry yeast is made by withdrawing water from moist yeast, by means of an exacting and delicate process, so that the yeast is thrown into a state of dormancy. Compressed yeast is highly perishable, requires refrigeration, and at best has a limited storage life, whereas active dry yeast does not need to be refrigerated and retains its activity for prolonged periods. A remarkable property of this product is its ability to revive and regain the active state within a few minutes, once it has been moistened and supplied

GROWTH OF MEMBERSHIP OF ENGINEERING SOCIETIES IN THE UNITED STATES



ABBR.	NAME	FOUNDED
— A.S.C.E.	— AMERICAN SOCIETY OF CIVIL ENGINEERS	1852
- - - A.I.M.M.E.	- - - AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS	1871
— A.S.M.E.	— AMERICAN SOCIETY OF MECHANICAL ENGINEERS	1880
- - - A.I.E.E.	- - - AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS	1884
- - - S.N.A.&M.E.	- - - SOCIETY OF NAVAL ARCHITECTS AND MARINE ENGINEERS	1893
- - - S.A.E.	- - - SOCIETY OF AUTOMOTIVE ENGINEERS	1905
- - - A.I.C.H.E.	- - - AMERICAN INSTITUTE OF CHEMICAL ENGINEERS	1908
- - - I.R.E.	- - - INSTITUTE OF RADIO ENGINEERS	1912

with fermentable sugars. Therefore, it may be prepared for use in baking almost as quickly as compressed yeast.

Some active dry yeast was made before World War II, but the war stimulated not only improvement of the product but also a vast expansion of facilities for its manufacture. Great quantities of this yeast were used by the armed services of the United States in the field, because lack of refrigeration necessitated reliance on this form of yeast, and because freshly baked bread is a staple food of fighting men. After the war, active dry yeast was returned to the civilian market. Recently, active dry yeast has entirely supplanted yeast cakes in retail stores in sections of this country. The nonperishability and prolonged stability of the dry yeast offer advantages to both the grocery dealer and the housewife.

Thus induction of dormancy by desiccation, a widespread natural phenomenon, has been brought under technological control, to make possible large-scale manufacture of a food product that was a vital factor in the good feeding of our armed forces during the war, and that now is becoming increasingly important in normal peacetime civilian food supplies.

Our Engineering Population

PERHAPS more than any other single event, World War II is responsible for public recognition of the utilitarian value of science and engineering. It is a far cry, indeed, from the guillotining of the scientific Lavoisier (because the revolutionary Coffinhal, President of the Tribunal, who tried his case, believed that "The Republic has no need for savants") to the present time when a significant part of this country's national income is devoted to research by educational institutions, industry, and government.

As a profession for which men could be trained at the college level, engineering is hardly a century old. In the address "Tomb of the Dead Languages," delivered before the Newcomen Society of England in Montreal on October 21, Karl T. Compton, chairman of the M.I.T. Corporation, traced the early history of engineering education in Europe and the United States. His address is the source of the following information:

Already in the United States, the U.S. Military Academy had been operating really as a polytechnic school since its reorganization under Colonel Sylvanus Thayer, in 1817. Rensselaer School, which later became the Rensselaer Polytechnic Institute, had been operating since 1824 as the first professional school of civil engineering in the English-speaking world. Union College introduced civil engineering in 1845. Dartmouth founded the Chandler Scientific School in 1851, and the University of Michigan introduced instruction in engineering in 1852. . . . In 1847 the Lawrence Scientific School was founded at Harvard University by an initial gift of \$50,000 from Abbott Lawrence, and simultaneously at Yale University was begun a department of Philosophy and Arts, later in 1860 to become the Sheffield Scientific School.

But although the organization of schools of science and engineering yields important data from which the beginnings of the engineering profession may be

measured, the extent of engineering practice is probably more precisely gauged by the membership figures of the professional engineering societies. Such figures have been compiled for the larger of the national organizations, and are presented in graphical form on page 212. Although the data can hardly be regarded as precisely accounting for all those having a professional responsibility in engineering — because of some duplication of membership, as well as for lack of complete coverage — the composite picture does appear to provide a reliable index of the growth and importance of engineering personnel during the past seven decades. During this period, all but one of the major national engineering societies were formed.

It would be expected, of course, that the organization of a national engineering society would lag behind the development of a specific branch of physical science. Likewise it may be expected that the formation of an engineering society would correspond roughly with the rise of engineering activity in a given field. This is borne out by the dates of founding of the major societies in the United States. As changing conditions warranted, the more specialized branches of engineering sometimes came to assume such importance that new societies sprang up to meet new needs. Thus, for example, the marine, automotive, and radio engineers evolved from groups which were previously catalogued as mechanical or electrical engineers. Some of the more highly specialized groups have grown to such an extent that they threaten to exceed the membership of the older and broader group with which they might logically be affiliated. So far, however, the tail has not yet wagged the dog.

The membership curves also illustrate the relatively rapid growth of the younger engineering societies compared with that of the more venerated organizations. One explanation for this state of affairs may be that there is now a greater awareness of the benefits of engineering than existed decades ago. Another may stem from the greater support which industry has given to research for the past two or three decades. But despite widely differing rates of growth, the trend in recent years has been for the membership of the largest engineering societies to cluster in the vicinity of 25,000. In this tendency, there may be a hint that the different branches of engineering are coalescing and that the rigid, somewhat arbitrary, barriers which had been separating one branch of engineering from another may be breaking down.

The graph also shows growth of population in the United States during the past 70 years (reduced by a factor of 1,000 as indicated), along with the total membership of the societies represented in the individual curves. These two top curves show, perhaps more significantly than any other data given here, the manner in which engineering has entered into our daily lives, and also gives some hint of the important role which engineering-minded persons may be expected to play in the nation's welfare. In 1880 there was one member of a major engineering society for every 30,800 of population. By the turn of the century the proportion of engineers had grown to one for each 8,900 persons. Shortly after World War I, there was one engineer for each 2,120 persons, and the present figure is something like one out of 910 persons. If the present trend

continues, there will be one member of a major national engineering society for every 795 persons in this country by 1950. Thus, as indicated by the figures given here, more than one-tenth of one per cent of this country's population already has more than a speaking acquaintance with the slide rule—traditional symbol of our growing engineering population.

Gargantua

GIVE me a place to stand," said Archimedes, "and I will move the earth." Give the modern engineer a machine big enough to test full-sized structures and he will redesign them to meet their loads with the utmost refinement in weight and form and efficiency. Taking him at his word, the Naval Air Experimental Station, at the Philadelphia Navy Yard, has built the world's largest testing machine—a Gargantua that can pull or crush a test specimen with a load amounting to 5,000,000 pounds.

The purpose of this giant of force is to make stress-and-strain tests upon structural members of machines in full size, for the first time getting away from models. It can accommodate a specimen 30 feet long, for tension and compression, and 50 feet long in bending. It towers 47 feet above its massive concrete and steel foundations, and derives its brute force from a hydraulic ram operated at a pressure of 2,500 pounds per square inch.

At first glance, the science of aeronautics would seem the last field for supertesting machines, dealing as it does with delicate streamlining and feather-

weight materials. Actually, aerodynamic forces to be met by the airplanes of tomorrow are gigantic. Hurting with bulletlike speeds through the air, wings and fuselages may meet conditions as severe as those encountered in big guns. It is well known that, at the speed of sound, the forces produced are at almost unbelievably great magnitude. The modern design engineer's problem is to prevent the airplane from distorting and thus setting up harmonic vibrations which soon pull it apart. One of his major concerns is to achieve stiffness without excessive weight.

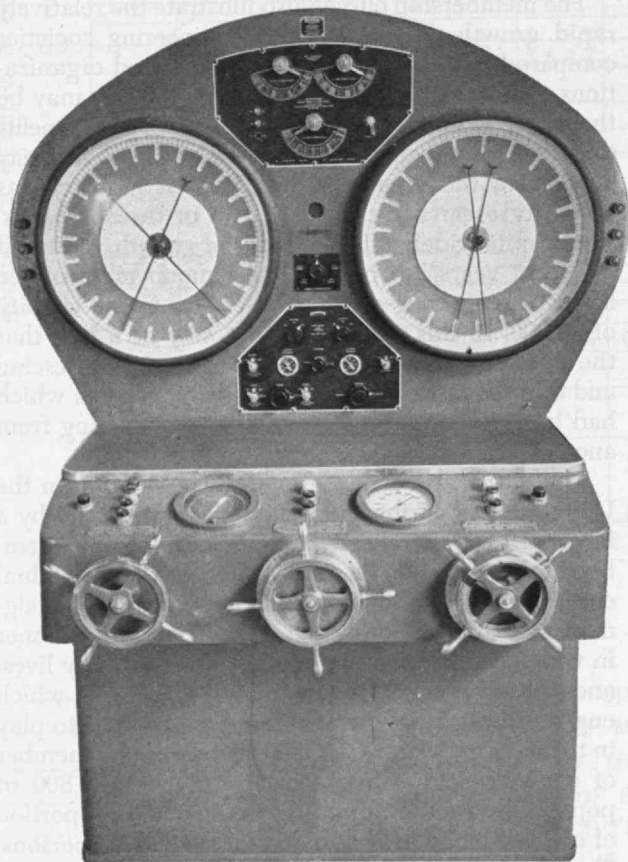
Extreme stiffness is a characteristic not usually sought in engineering design. Most structures are intended to yield slightly. A bridge, for example, is expected to distort slightly under load, and may be quite elastic. But consider the old problem of the company of soldiers marching in step across the bridge and destroying it—or the modern one of the failure of the Tacoma Bridge in a moderate breeze. If soldiers had to keep step on a bridge it would have to be constructed so rigidly that it could not fall into harmonic vibration and wreck itself. This illustrates the present dilemma of the airplane designer.

Stiffness is a fundamental requirement in high-performance airplanes. It must be achieved by theoretical methods checked with flight tests and wind-tunnel models. Unfortunately, owing to the "mass effect," stress analysis on models is not a safe guide to actual operating stresses and their consequent strains in full-sized structures. This is the reason for the Navy's new 5,000,000-pound Gargantua, and two smaller machines which will be set up alongside it in a new structural testing laboratory in Philadelphia.

The huge machine was built by the Baldwin Locomotive Works to tolerances of a few thousandths of an inch. In principle it consists of a massive steel arch, the inner surfaces of which form vertical guides. A sensitive crosshead is fitted to slide up and down between them, its position determined by a pair of vertical screws which are nine inches in diameter. High in the machine is a fixed crosshead, and at its foot a fixed base. The motion of the sensitive crosshead downward permits the crushing of a specimen between it and the bed, or the pulling of a sample in tension between it and the upper structure. Specimens subjected to bending are carried on an extension of the bed integral with the foundations. Unlike most testing machines, the force is not applied by turning the screws, which merely adjust the space for the specimen. Instead, the whole assembly of screws and crosshead is forced downward by hydraulic pressure acting between a stationary piston in the base and a cylinder carried in a movable crosshead at the bottom.

The principal purpose of the machine is to study, by means of extremely sensitive strain gauges, the behavior of the sample as load is gradually applied. As many as 100 of these gauges can be located about the specimen to show exactly where the structural shape gives way during loading. The gauges are a Baldwin product also, and consist of tiny, bonded resistance wire arrangements which transmit continuous displacement readings to dials on a console control station on the test floor. Increments of as little as four

(Concluded on page 240)



Naval Air Experimental Station

The control panel for the U.S. Navy's massive testing machine peers at the operator with owl-like eyes.

The Price of Haste

*The Relatively Good Safety Record of Modern Aviation
Can Be Greatly Improved with Present Knowledge
and a Willingness to Make Haste Slowly*

By W. MACK ANGAS and WILLIAM T. HARDAKER

To fly, or not to fly: that is the question. At least it's often the question uppermost in the mind of a busy American contemplating a journey of any considerable length. When air lines were first established the average American patronized them infrequently and then only when time saving was a matter of great urgency. But now everyone has friends who are habitual air travelers. To this growing and highly articulate group, air travel is so rapid and convenient that its risks should be accepted by the progressive. And the risks, they urge, are not great. For have not our domestic air lines, since 1938, been able to show passenger mileages equivalent to over 1,000 trips around the world at the equator for each passenger killed in an accident?

But a bad accident, such as that which killed 11 students returning to Yale University after their Christmas holiday, or a series of fatal crashes, such as occurred in May and June of 1947, will temporarily shake the faith of the public in the reasonable safety

David W. Corson from A. DeVaney, Inc.



Keystone View Company

of air travel. Is the average traveler justified in his recurrent doubts as to the reasonable safety of commercial air transportation? If his doubts are wholly or partially justified, what should be done by government agencies, by the air lines, and the aviation industry to improve the safety of air travel? Finally, what should the traveler himself do about it? These questions are closely related, but let us, for the sake of clarity, consider them one at a time. First, then: Are our domestic air lines offering reasonably safe transportation to the traveling public?

Aviators, aeronautical engineers, and other engineers brought into close contact with aviation have long shared the confirmed air traveler's scorn of the timid soul who won't fly. They have usually found themselves among those urging the reasonable safety of air travel upon the conservative, but nevertheless convincing, American traveler. They have argued the necessity of accepting the inevitable risks of using mechanisms if the advantages of life in a mechanized age are to be realized fully. They have pointed out the undeniable fact that risks of this kind are accepted by everyone who travels by land or water, and that if travel is undertaken by automobile the risk may be considerable. Now, however, a number of aviators and engineers familiar with the problems of aviation find themselves not merely sharing the recurrent doubts of the public as to reasonable safety of air travel; they find themselves reaching the conclusion that improvement in the safety of air transportation has not been commensurate with technological de-





Official U.S. Navy Photograph

Two operators of the Ground Control Approach system instruct the airplane pilot, by radio, as to safe landing in overcast weather.

velopments in aviation. They also find themselves reaching the conclusion that safety on our air lines has been sacrificed in an attempt to anticipate hastily today the achievements that may be realized safely tomorrow.

That there has been little improvement in the safety of our domestic air lines during the past 10 years is undeniable. Here are the official figures of the Civil Aeronautics Board (estimated for 1948) which include trunk, feeder, and territorial carriers:

Years	Passenger Miles Flown	Passenger Fatalities	Passenger Miles Flown Per Passenger Fatality
1939	755,347,796	9	83,927,533
1940	1,158,994,132	35	33,114,118
1941	1,507,238,053	35	43,063,944
1942	1,500,762,963	55	27,286,599
1943	1,670,934,726	22	75,951,578
1944	2,213,251,851	48	46,109,413
1945	3,408,289,906	76	44,845,920
1946	6,068,317,417	75	80,910,899
1947	6,313,220,664	199	31,724,727
1948	6,000,000,000	83	72,289,157
For 10 Years	30,596,357,508	637	48,031,948

The figures for Passenger Miles Flown Per Passenger Fatality, therefore, show the year 1939 to have been the safest one in which to travel by American domestic air lines! And the record of the year 1947 was next to the worst of the last 10! Too much importance should not, of course, be given to the figures for a single bad year. Let us, therefore, compute and examine the figures for the first three and last three years of the decade. Here they are:

Years	Passenger Miles Flown	Passenger Fatalities	Passenger Miles Flown Per Passenger Fatality
1939, 1940, 1941	3,421,579,981	79	43,311,139
1946, 1947, 1948	18,381,538,081	357	51,488,902

The figures for the last three years of the decade are therefore distinctly better than for the first three years, and slightly better than the average figure for the entire 10-year period. It is a disappointing showing, however, for 10 years in which great technological developments in aviation were unquestionably made. What is wrong? Will a review of the three crashes which prompted the appointment of President Truman's Air Safety Board throw light on the trouble?

The first of these occurred on May 29, 1947. United Air Lines Flight Number 521 was about to leave LaGuardia Field for Cleveland. The airplane, a DC-4, had taken aboard 44 passengers and taxied to the north end of runway 18, where it stood while the pilot warmed up its four motors, tested them, and awaited final clearance. There was a strong but pleasant southerly breeze.

To the northwest and west the skyline of New York was being rapidly obscured by the murk of an approaching thunder squall.

The scene in the cabin may be imagined. Seasoned air travelers confidently fastened their safety belts while the uninitiated fumbled nervously with theirs and were finally helped to fasten them. Desultory conversations commenced, but were soon ended by the roar of the motors as the plane moved forward onto the runway. The volume of sound again increased as the take-off run started. Faster and faster the dimly seen earth rushed past the windows. Suddenly the confident roar of the four motors choked to a coughing sputter, passengers were thrown violently forward against their safety belts and the tires shrieked in protest as they slid on the pavement. It was now the experienced air travelers who were badly frightened, for the pilot was evidently trying to halt the take-off. But the airplane continued toward the end of the runway, swaying and yawing in its now obviously uncontrolled rush. As it went through the fence at the end of the field and ricocheted across the depressed pavements of Grand Central Motor Parkway, there was a rending crash, accompanied by screams, and the lights of cars glared for an instant into the cabin windows. Then with a final shuddering crash the doomed air liner came to rest. A moment later it was enveloped in flame. Of the 44 killed or fatally injured in the resulting holocaust, the fortunate were those unconscious when reached by the fire.

For some little time the hypothesis was widely accepted that the accident was caused by a sudden wind shift occurring just as the airplane started its take-off. Such wind shifts are by no means uncommon at the onset of thunder squalls. This one, according to early investigators of the accident, suddenly changed a head wind, which favored a prompt take-off, into a cross wind in which the heavily loaded plane couldn't get off the ground within the 3,500-foot length of runway 18.

Investigation of the cause of the crash by Civil Aeronautics Administration officials did not, however, substantiate the wind-shift theory. Evidence was found that the pilot, an experienced man and one of the few survivors of the accident, had failed to release the gust-lock with which the rudder and other control surfaces of a large airplane are immobilized when it is on the ground. Investigators of the Civil Aeronautics Administration also found that the much discussed wind shift occurred before, and not after, the airplane started its abortive take-off. But acceptance of the gust-lock theory as the cause of this accident does not explain the almost fantastically incredible fact that at the principal airport of the world's largest city, a heavily loaded, four-motor transport plane was permitted to attempt a cross wind take-off in the early phases of a heavy thunder squall from a 3,500-foot runway! During World War II, the Navy's Seabees built runways 5,000, 6,000 and even 7,500 feet long on Pacific Islands for four-motor bombers and transports! Is not the traveling public, in time of peace, entitled to safety factors equivalent to those provided military personnel in time of war?

To guard against accidents caused by unforeseen contingencies, aircraft are designed and built with adequate safety factors. Should not the fields from which they operate provide similar protection to the occupants of planes? And should the shortness of runway 18 at La Guardia Field be completely eliminated as a factor provocative of an accident in which 44 lives were lost? Why was not the plane ordered to another and longer runway if the wind shift occurred before the plane commenced its fatal attempt to take off? Was not a serious risk being run merely to save time? Why did the pilot forget to release the gust lock? Did not the knowledge that he faced a risky take-off under adverse conditions, from a runway of questionable length, place him under a strain such as is provocative of oversights? Were he and the copilot given an adequate "check-off list" to help them insure the proper setting of the numerous controls of a big transport plane before attempting a take-off or landing? It is significant that runway 18 at La Guardia Airport was closed to four-motor transport planes shortly after the accident. It is also significant, and disquieting, that air lines protested the order, probably because it slows down departures by increasing taxiing distances and decreases the number of runways available for simultaneous take-offs.

Two days after the crash at La Guardia, representatives of the Civil Aeronautics Board were returning to Washington from New York where they had been investigating the cause of the accident. As they approached the Susquehanna River in their DC-3, an Eastern Airliner overtook and passed beneath them on its way toward Miami. More or less idly they watched the steady and majestic progress of the DC-4. Suddenly it nosed down sharply. Momentarily expecting it to level off and resume its southward flight, they were horrified to see it go into a vertical dive. This then became the beginning of an outside loop which terminated in a burst of flame and pall of smoke from the woods near Port Deposit. Obviously there could be no survivors.

The cause of this crash will probably never be known definitely. Perhaps it should be classified as a type of accident which will occasionally happen in the air, at sea, or on land as long as men must entrust their lives to the proper functioning of mechanisms. Speculation as to the possible cause of such an accident, may, however, be profitable and productive of improved safety measures. A reasonable hypothesis as to the cause of this crash may in fact be based on events leading to an alarming near-accident which occurred a few months later near El Paso.

An American Air Lines DC-4 was flying in good weather at an altitude of about 8,000 feet. A check pilot, riding behind the pilots who were actually flying the plane, surreptitiously fastened the gust lock, apparently to see what would happen. The airplane began a gradual but steady climb which the puzzled pilot sought to correct by adjusting the trim tabs to bring the nose down. Then the prankster, or perhaps it would be more charitable to say "experimenter," suddenly released the gust lock. The plane immediately went into a dive. Terrified passengers were thrown from their seats as were the first pilot and check pilot. Fortunately, however, the copilot was securely strapped in, and was thus able to regain control of the plane and land it safely.

It is almost incredible that a similar prank caused the Port Deposit crash. It is, however, entirely credible that a sudden failure of the automatic gyro pilot, or an unanticipated local air disturbance, may have sent the airplane into a violent dive and that the pilot and copilot, if not securely strapped into their seats, were unable to regain control in time to prevent a crash. Regulations requiring all occupants of the control cockpit of a transport plane to keep their safety belts fastened at all times should be rigidly enforced. This is the lesson of the Port Deposit crash when coupled with the El Paso incident, even if it is only based on speculation as to the actual cause of the crash.

One may, however, do more than speculate as to the cause of the next major air-line accident. Hardly had the difficult and grisly task of assembling and identifying the 53 charred and dismembered bodies at Port Deposit been completed when tragedy again struck the air lines. On June 13, a Pennsylvania Central air liner from Chicago failed to arrive at Washington's National Airport though it had been in communication with Washington as to methods of approach. It was raining, the ceiling was low, and airplanes were flying, in general, on instruments. At the airport, friends and relatives waiting to greet the air-liner's passengers became at first uneasy, and then fearful, as minutes and hours passed without news of the plane having landed safely elsewhere. But the fate of the plane, its 47 passengers and crew of three did not long remain a mystery.

Next morning the occupants of a searching airplane saw, near the top of an eastern outpost of the Blue Ridge, a patch of fire-scarred vegetation surrounding the scattered and torn wreckage of the missing air liner. The improbability of anyone having survived the crash was confirmed when a rescue party reached the wreck. The cause of the crash was not difficult to determine.

The airplane had been approaching Washington on instruments at an assigned altitude well above the tops of mountains over which it had passed. This altitude would have brought it into the "stack" of airplanes "holding" in the overcast above Washington. It would then have been required to "hold," that is, to fly within a prescribed area and at an assigned altitude, until given clearance to descend, make its approach to the field, and land. To avoid the delay incident to this procedure, a delay always exasperating to passengers, the pilot had requested permission to descend before reaching the immediate vicinity of Washington and make his approach to the airport under the overcast on contact flight rules. This permission was granted by the airway traffic controller in Washington, provided visual contact with the ground could be maintained at 2,500 feet from Arcola. The airplane crashed into a 1,689-foot ridge 150 feet below its summit, apparently while descending. The cost of trying to save a few minutes, or at the most a couple of hours, was 50 lives. The procedure was one which could, in all probability, have been followed safely by an airplane carrying radar equipment of a type fully developed but not yet adopted as standard equipment on airliners.

A Program of Rational Action

The crash of this plane brought the number of lives lost on scheduled commercial flights of domestic air lines in the United States in May and June of 1947 to a total of 147. Of this number, 94 lives were lost in accidents which may fairly be classed as preventable. They were lost in accidents attributable directly or indirectly to some form of haste. No figure, no matter how impressive, as to the number of passenger miles flown in safety during the same period should be considered as an offset against this tragic waste of human life. Truly, in May and June of 1947, the price of haste was high. What has been done to reduce it? What is being done? What should be done?

Undoubtedly much has been accomplished by governmental agencies. There has been a general and laudable tightening of flight regulations, largely no doubt through the efforts of the President's Safety Board. The rules regarding the closely interrelated subjects of airplane loadings, runway lengths, take-offs, and landings have, for example, been reviewed and revised. Standardized check-off lists have been adopted to facilitate thorough preparation for take-offs and landings, which are the more risky phases of normal flights. Regulations covering minimum altitudes over mountainous terrain in instrument weather have also been revised in the interest of safety. These are things which could be done immediately without considerable outlay. It is gratifying to know that they have been done and that they are making commercial air transportation safer today than it was two years ago. But they are measures which do not interfere seriously with any well-established practice of air travelers, and they are therefore measures which were unlikely to encounter strong opposition. Our record has been less impressive when we consider our failure to adopt safety measures which would be unpopular with the traveling public and the air lines.

One such unpopular measure which probably should be adopted is the prohibition of smoking in planes. Do we, the authors, smoke in planes? Assuredly we do, and we'll continue to do so as long as smoking is permitted and others do it. But that doesn't make it safe! Aircraft carrying such highly volatile fuels as gasoline are fundamentally unsafe places in which to smoke. What the effect of a strictly applied "no smoking" regulation might be on the volume of business done by commercial air lines is difficult to estimate. There is no doubt, however, that such a regulation would make air travel safer. Our forefathers dreaded, as we still dread, fire at sea. But fire at sea, terrible as it can be, does not always threaten swift, immediate, and almost inevitable death to all hands, as does fire in the air. How many crashes are due to fires occurring on aircraft in flight will never be known, as a high percentage of such fires must terminate in crashes that leave no survivors, and only a mass of charred wreckage from which little can be deduced.

But our failure to prohibit smoking in airplanes using gasoline as fuel is not our only failure to adopt unpopular safety measures. Clearance authorities should be more chary about giving clearances to airplanes headed for destinations at which weather conditions will permit landings only under unfavorable circumstances. The "stacking" of airplanes over a busy airport in instrument weather isn't an overly safe procedure and sooner or later we're going to have a collision in a "stack." In fact, such an accident occurred last year on July 4 when a Royal Air Force military transport plane collided with a Scandinavian Airways four-motor air liner over Northolt Airport near London. The 25 passengers of the air liner, its crew of seven, and the six occupants of the military transport were, of course, killed. It is inevitable that the stacking of planes in the vicinity of a big airport will occasionally be necessitated by the sudden onset of instrument weather, but the procedure is one which should be avoided, even at the cost of serious interference with scheduled air-line operations. This is a safety measure which should be taken before, not after, all the passengers of two big transport planes perish in what may well be commercial aviation's worst disaster in lives and property lost.

A possible solution of this problem may be the adoption of a block-signal system on our airways. Such a system has been proposed and is analogous to the familiar railroad signal system from which it takes its name. It would provide for horizontal spacing of airplanes on the same route in addition to the vertical spacing now provided. The system cannot, however, be placed in operation prior to the extensive installation of equipment not yet manufactured. It will, therefore, probably be at least five years before such a block-signal system could be placed in service, even if funds for the necessary installations were made available immediately.

Of course the danger of landing in bad weather will be greatly reduced when the Instrument Landing System and Ground Control Approach, much publicized as "ILS" and "GCA," come into common use. At an airport equipped with ILS the pilot of an airplane carrying present-day, standard radio and flight instru-

ments, plus a relatively simple and light glide-path receiver, can approach a designated runway and land on it in weather so thick that a landing by traditional methods would be impossible. In using the system, the pilot is guided by instruments which he himself sees and the readings of which he interprets. At an airport equipped with GCA a pilot in an airplane carrying standard flight and radio instruments, without additional equipment, may similarly make a landing in thick weather. In landing by GCA the pilot maneuvers in accordance with instructions obtained by radio from a ground crew which determines the position of the airplane during its approach by means of highly specialized radar instruments. Both ILS and GCA have stood the test of actual use over extended periods by the Army, Navy, and Air Force. Supplemented by improved approach lights, and by surveillance radar enabling the flight tower crew to locate planes in an impenetrable overcast, ILS and GCA will do much to solve the problem of getting airplanes safely onto the ground in instrument weather.

But neither ILS nor GCA can be effective until installed, and though a number of installations have been made, an enormous amount of work remains to be done. To be specific, 98 instrument-landing systems were authorized in appropriations prior to the fiscal year 1948. To carry on the work in that year, it was recommended to Congress that 184 units of four types — improved approach lights, GCA, surveillance radar, and ILS — be installed at an estimated cost of \$13,428,000. This was reduced by the House of Representatives to \$5,930,000, which would cover the cost of about 78 units, and by the Senate to \$571,706, which would cover the cost of only a meager fraction of what was needed. Fortunately, however, appropriations for the fiscal year 1949 are more generous and provide funds which will enable the Civil Aeronautics Administration to establish 10 additional high-intensity approach lights, 40 instrument-landing systems, 17 airport surveillance radar installations, and 7 GCA in-

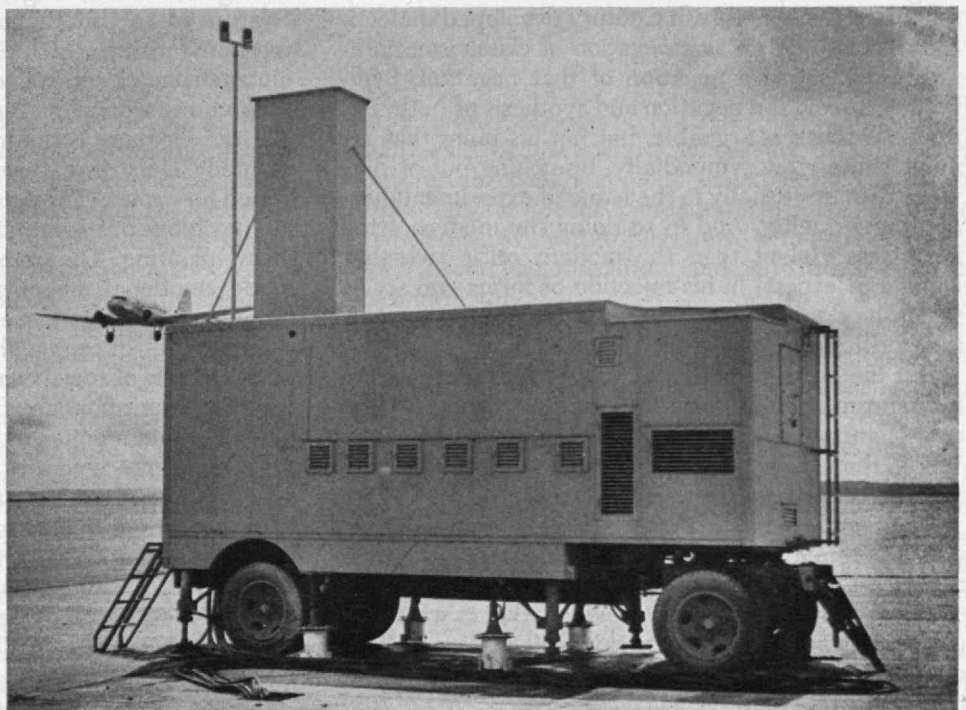
stallations within the continental limits of the United States. These are, of course, steps in the right direction, but they fall far short of furnishing everything considered necessary by those striving for maximum safety of our airways. If we are to have safer air travel, we will have to pay for it.

The installation of such aids to aerial navigation by the Federal Government will by no means solve the entire problem. State and local authorities face a far heavier task; the task of providing the auxiliary airports required to realize fully the possibility of reasonably safe all-weather air transportation promised by such systems as ILS and GCA. For even the most enthusiastic admirers of these systems do not claim that landings can be made by them in bad weather with anything like the rapidity possible in good weather under contact flight rules. A large and well-equipped airport can easily bring in an airplane a minute under the latter conditions, while the best it can hope to do in bad weather with ILS or GCA is about one plane every four minutes. If a port is scheduled to handle 60 planes an hour and the onset of instrument weather suddenly reduces its capacity to 15 planes, what are the other 45 airplanes going to do? If the conditions producing low visibility are temporary, such as a shower, airplanes may be held overhead or at designated holding points until conditions improve. If, however, the instrument weather promises to be of long duration, most of the airplanes must obviously be diverted to auxiliary fields at which they may descend by instrument let down, or to alternate fields still in an area of good weather. The provision of the necessary auxiliary airports to make such an arrangement possible at our more important cities and air terminals is a very large undertaking. It is not, however, an undertaking beyond the capacity of the American people.

So much then for the responsibilities of governmental agencies — Federal, state, and local — in giving

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The danger of landing airplanes in bad weather will be greatly reduced when the Instrument Landing and Ground Control Approach systems come into common use. In landing by GCA, the pilot maneuvers in accordance with instructions from a ground crew which determines the position of the airplane during its approach by means of highly specialized radar equipment. In the installation shown, the GCA equipment is housed in a mobile truck.



U.S. Navy Photograph

THE CASE AGAINST

The Rebel Painters

*When Viewed in the Light of Their Own Writings
the Work of the Modern Painter Often
Takes on New Significance*

By PAUL MEADOWS

THE modern artist is a much maligned person. His critics range from the editorial organs of the Communist party to the President of the United States, and include professional artists and those without artistic qualifications. The complaints vary from failure to understand what it is all about to severe aesthetic strictures on experimental technique; charges of obscurantism and sensationalism mingle freely. No form of art is free from indictment, neither literary nor plastic, nor graphic. And the bill of particulars is by now a venerable document.

For the modern artist was calumniated from the start — whenever that was. The critics of the 'Forties hew to the line of the critics of the 'Nineties. Of course, what was *avant-garde* (and therefore suspect) in the *fin de siècle* days of the Nineteenth Century has for a generation now been academic and even popular art. Yet the stream of protest flows noisily on its way, and seems to be practically unstemmed.

The reasons are not hard to find. Most modern art movements have grown as revolts against existing or prevailing art. There is a pronounced rebel theme in modern art. Thus, the literary critic, Edmund Wilson, sought to show, in his *Axel's Castle*,¹ that the literary schools of the Nineteenth Century developed dialectically: Romanticism as a negation of classicism, naturalism-realism as a negation of that negation. Symbolism, he felt, is a negation and synthesis of both. His dialectic thesis is arguable, but not his point that art movements grow sympodially, branching out of previous dissents, usually in the name of experimentalism and individuality. And in so doing the modern artist is no less violent than the modern critic (whether layman or expert) in his rejection of forms and styles which he does not care to use. If artist attacks artist, their critics can at least plead precedent.

But the curse of obscurantism or decadence or exhibitionism or infantilism falls as easily from the lips of a Rotarian Babbitt as from an initiated aesthete. What, then, is bothering both the critical observer and the critical artist?

One ventures to say that it is a case of shock. The artist, as rebel, is in revolt against the past in art and the present in culture, both of which shock him. And the form and technique of his revolt — that *to* which he is revolting — succeed in shocking his audience. The case against the modern artist is the style and direction of his rebellion.

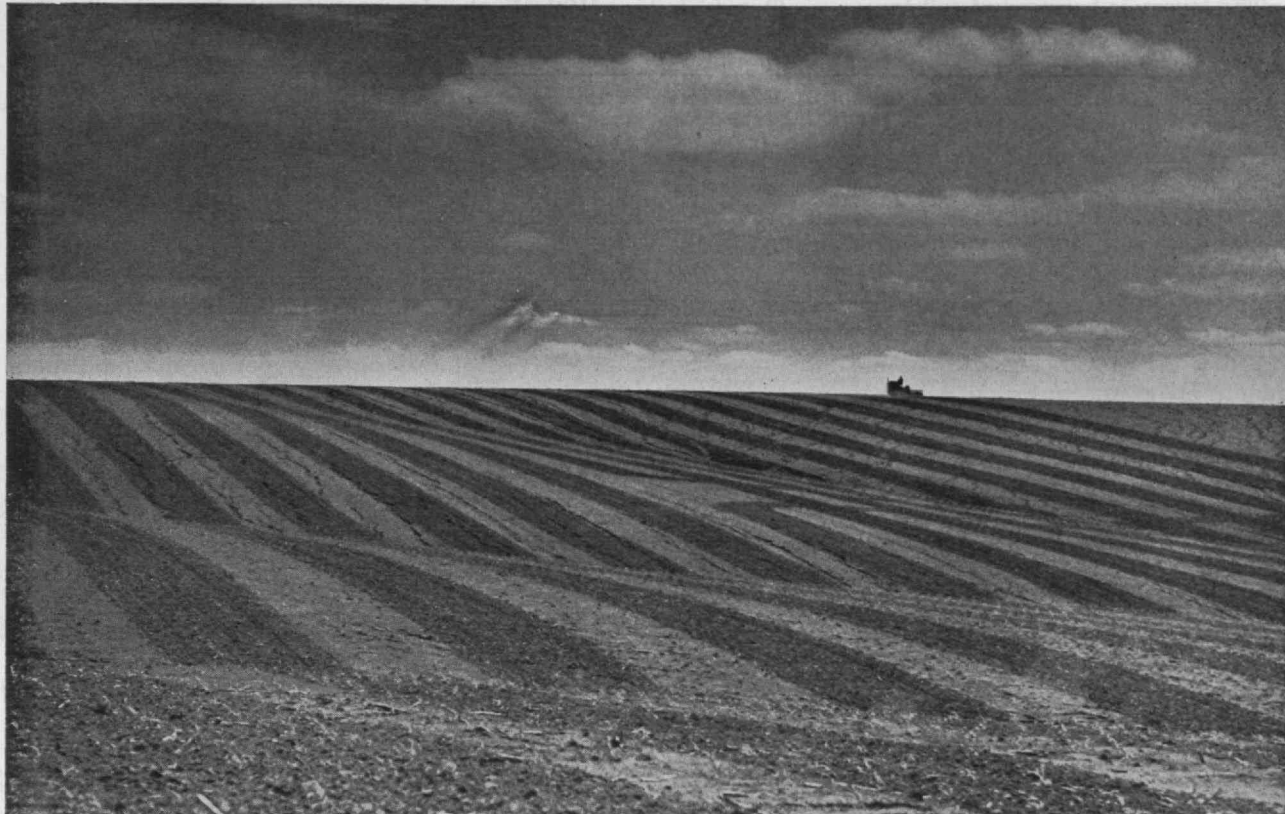
Consider the case against the rebel painters; consider it especially in terms of their own words, not their paintings. For what they say about their work continues to be even more a cause of shock to the modern observer than their paintings. Documentation is abundant: the painter often is as facile with his pen as with his brush.

Examine, for example, the comments of one, Francis Picabia, writing in *The Little Review*² in the year 1922. "*Le Salon d'Automne* will open in a few days. May I offer a word of advice to the members of the jury: to refuse pitilessly all that they like and accept only that which horrifies them." You see that we come to the point immediately. The unacceptable, the horrible, must become the acceptable. Dali would agree, emphatically; and Grosz.

The subject matter of the rebel painters is, more often than not, unpredictable, private horror, victim of impulses unknown either to artist or observer. Writes William Baziotes:³ "I keep working on my canvas until I think it is finished. The subject matter may be revealed to me in the middle of the work, or I may not recognize it until a long time afterward." Or again, Boris Margo,⁴ speaking of his painting "Nature of an Unfathomable World": "The painting is a pure fantasy of shapes and images which undergo metamorphoses controlled by forces of light. In this, as in all my work, I had no desire to achieve absolute clarity." Or there is the instance of Leon Kelly,⁵ who painted "Departure through the Umbrellas," about which he wrote: "The actors or subjects in the picture are flexible forms complying suitably to the evolution of my painting. The umbrella shape . . . has a dramatic emotional meaning to me. The insect in the painting represents the ego." He did not say whose.

Sometimes, of course, the rebellious modern painter plays the role of social commentator. Thus, Marinetti,⁶ leader of the quondam futurists, declared in his famous London manifesto: "We are against the universal right of the ignorant to discuss and decide upon all questions of art." He asked his futurists "to cultivate the hatred of intelligence and to reawaken that divine intuition which is the characteristic gift of the Latin races." Soffici,⁷ one of the group, inveighed against "mob interference in matters of art," in place of which he called for "enthusiastic recognition of intellectual superiority."

(Continued on page 242)



J. W. McManigal from Gendreau

THE PROFESSION OF Soil Conservation

*Engineering and Agriculture Meet on Common Ground
in Striving for More Planet and Less Plunder*

By EDWARD H. GRAHAM

LAST year, Ira N. Gabrielson, President of Wildlife Management Institute, defined conservation as "the wise use of our natural resources." He pointed out that conservation is not the locking up of resources for some distant future use. Conservation is the matter of using wisely, and with care, the resources with which this land was originally endowed, or what remains of them. One of these natural resources, the soil—and its conservation—is the subject of this present article.

In order to consider the subject of soil conservation, either in general or in its specialized engineering aspects, it is first necessary to examine the nature and composition of soil itself.

The Nature of Soil

In a general sense, soil may be defined as the weathered and otherwise modified outermost layer of the earth's crust. It is not the same everywhere. It varies from one climatic region to another. It varies with the type of vegetation. Soils developed under forests

have thinner surface layers and less organic matter than soils of grasslands, which are usually deep and fertile. Desert regions have poorly developed soils. Soils are not the same on uplands and river bottoms. Soils vary with topography, with type of underlying geological formation, and with other environmental factors.

Soil is more than disintegrated rock. It has definite structure, and a distinct form. Soils are developed over long periods of time, and they are different near the surface from what they are at some depth below. Soil usually consists of horizontal layers called the A, B, and C horizons, in order of depth. The A horizon is popularly called topsoil. The B horizon is subsoil. The C horizon is weathered but otherwise little changed parent material, below which is the underlying rock. Compared to the diameter of the earth, or even to the thickness of the geological formations composing the outermost layers of the earth's crust, soil forms an exceedingly thin veneer on our globe. It varies from a few inches in thickness to a few feet.

The layers or horizons of soil form a profile which results from the interaction of physical, chemical, and biological influences. Physical disintegration and chemical decomposition of mineral constituents and the recombination of the resulting substances contribute character to a soil profile. Just as important are the plant and animal components. Organic residues from plants and animals contribute to the character of soils. Nonorganic substances and organic materials together are constantly being redistributed as a consequence of water movement, leaching, and the activities of soil organisms.

Soil is far from being an inert medium. Bacteria, minute plants and tiny animals, fungi, molds, insects, roots of grasses, herbs, shrubs, and trees, and vertebrate animals live in the soil. A single particle of surface loam may contain 60,000,000 bacteria. An acre of Maryland meadow supports 13,500,000 invertebrates at no greater depth than "a bird can easily scratch." Soils of the Russian steppe are known to support as many as 415,000 ant nests per square kilometer. Ninety-five per cent of all insects invade the soil at some time. Earthworms and burrowing rodents cultivate, fertilize, and help to form the soil.

Soil, therefore, is a highly complex, rather delicate, medium that has resulted from a long history of slow development. It is a complex and intricate natural substance with a unique form and character.

Soil Erosion

Some kind of soil erosion has probably occurred since the first rain. Such normal erosion is a process as old as geological history, and in most regions of the world it is an imperceptibly slow, though persistent, action. It is usually so gradual that, as the upper portions of the soil profile are removed by wind or water, soil-building processes compensate for their removal by developing the lower portions of the profile. The result is the downward progress of the entire profile, and, geologically, eventual leveling of the landscape, or peneplanation.



It is of interest to engineers that Thomas Jefferson encouraged contour cultivation, which he called "horizontal plowing."

With the development of agriculture, man became an environmental factor of major importance. His use of fire and cultivation of the soil accelerated erosion. One of the first effects of man-induced erosion is the removal of the uppermost or A horizon at a rate faster than formative processes can replace it. This means loss of the richest and most productive portion of the soil first, for topsoil contains more organic matter and available plant nutrients than portions of the soil beneath it.

The loss of topsoil under conditions of use is tremendous. In an Oklahoma field where cotton was grown continuously on a 7.7 per cent slope, experiments showed that Vernon fine sandy loam lost 24 tons of soil per acre per year. Shelby silt loam in Missouri annually lost 68 tons of soil from an 8 per cent slope where corn was grown year after year. On a 16 per cent slope under continuous corn, Clinton silt loam in Wisconsin lost 88 tons annually. In each of the cases cited, the annual rainfall was between 30 and 35 inches.

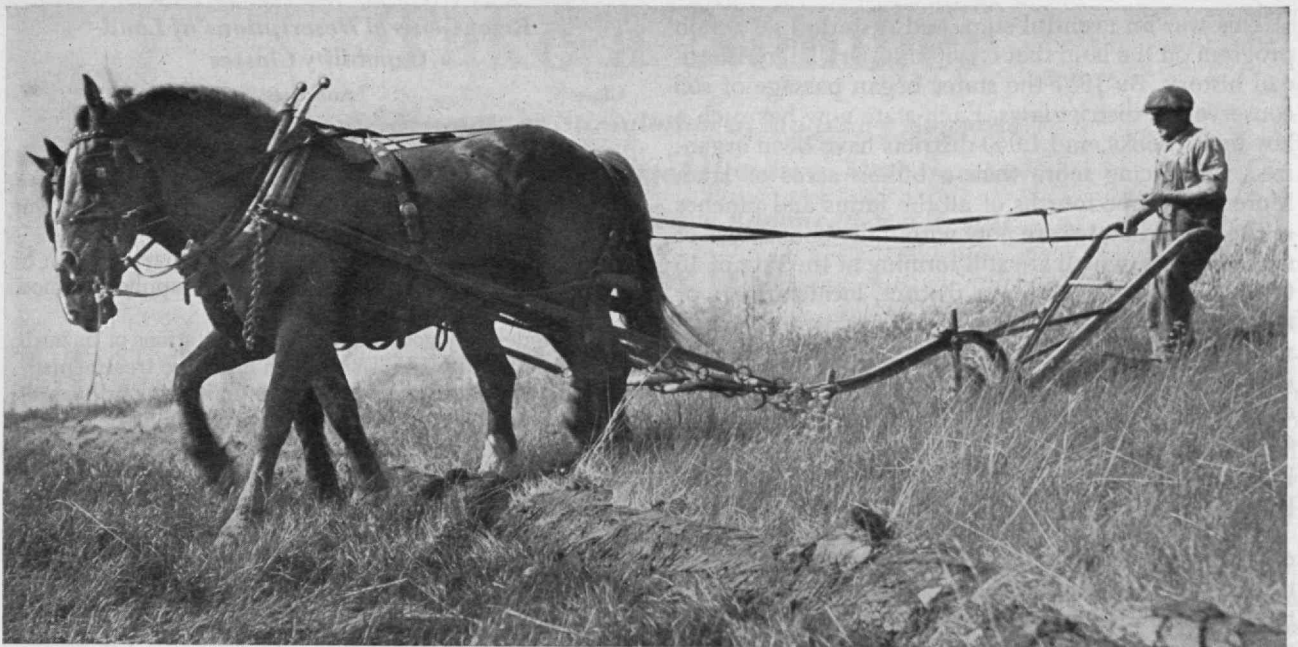
The extent of accelerated soil erosion is no less striking than its intensity. In the United States there are 1,903,000,000 acres of land. Slightly more than half this acreage is in farms and ranches. Man-induced erosion has severely damaged 282,000,000 acres of land. This is an area larger than that of Texas and California combined. Another 775,000,000 acres have been eroded to some extent. Thus, more than half our total land area is affected by man-induced erosion. About 460,000,000 acres of land in the United States are suitable for cultivation. About 100,000,000 acres of former cropland have been badly damaged by erosion. Erosion continues in the United States — to the extent that some 500,000 acres each year are made unfit for immediate practical cultivation.

On many lands, where little loss of soil actually takes place, soil depletion may nevertheless occur. This is true even on comparatively level areas if the land is improperly used. When chemical elements necessary to health and welfare are removed from the soil by cultivation, leaching, or other activity associated with use of the land, they are likely to be absent from the crops grown on those soils. All too little is known of this subject, but during World War II many young men from agricultural areas were declared unfit for service because of various deficiency diseases. Such diseases seem to be on the increase.

Public Interest in Erosion Control

It should be noted that erosion is just as serious, or even more advanced, in other parts of the world. In China, India, the Near East, Greece, North Africa, Italy, Spain, South Africa, Russia, Australia, New Zealand, and Central and South America, as well as in our own country, soil loss through accelerated, man-induced erosion is widespread and serious. It is becoming the concern of nations almost everywhere.

It has been obvious in the United States, since Colonial times, that we needed to protect the soil. In 1769, George Washington experimented in his Mount Vernon fields to determine "whether the land was not preserved more by harrowing than by lying in furrows." By the close of that century, much of the once produc-



Harold M. Lambert

With the development of agriculture, man became an environmental factor of major importance. His use of . . . cultivation of the soil accelerated erosion.

tive land along the Potomac had become practically worthless. In 1817, Thomas Jefferson wrote that "fields were no sooner cleared than washed." It is of interest to engineers that Jefferson encouraged contour cultivation, which he called "horizontal plowing."

Westward expansion to more fertile prairie lands minimized the need for attending to the care of the land. Land could be had for the taking, and in 1862 the Homestead Act encouraged people to stake claims on free land, with almost complete disregard of the capacity of the land to support them. Throughout the history of the nation there were voices raised in defense of the land, but they were weakly heard, if at all. Since the turn of the present century, however, there has been more and more interest in controlling erosion and in using the land well.

Today most states conduct research and education in soil conservation. All states support locally developed programs of soil conservation conducted by farmers and ranchers. There is a National Association of Soil Conservation Districts representing these local groups. Urban interest is expressed in another national organization, Friends of the Land. Within the Federal government there is a bureau devoted exclusively to this work — the Soil Conservation Service — and numerous other bureaus consider it in connection with their normal activities. There is today a professional society of soil conservationists — The Soil Conservation Society of America. Some 75 colleges and universities offer courses in soil conservation. Thirteen schools offer majors in the subject. The subject is receiving more and more attention on the part of the general public.

Attacking the Problem

All of this interest has resulted in the development of activity in a new and specialized field. There has developed, within the past 15 years, the profession of soil conservation.

Before it is possible to control erosion, it is first necessary to understand the process. Early soil surveys pointed to the problem. By the 1920's some of the states began to publish results of experimental work dealing with surface runoff and factors influencing soil erosion. In 1928 the United States House of Representatives provided for investigations into the causes of erosion, the possibility of increasing absorption of rainfall by the soil, and the development of means for preserving the soil, controlling destructive erosion and conserving rainfall.

As a result of this and subsequent Congressional action, 10 erosion-experiment stations were established on important types of farm land throughout the United States. Research in soil conservation is being actively pursued by the Federal government, the State Experiment Stations, and various colleges and universities. In many respects it is still a new field of study, especially in its practical or applied aspects, and engineering looms large in many of the problems to be solved. Water percolation, infiltration, and runoff are highly important phases of erosion, and they are primarily, although not exclusively, physical in nature.

As a result of the increased national interest in soil conservation and erosion control, a national program of erosion control was inaugurated in 1933. This took permanent form on April 27, 1935 in the passage of the Soil Conservation Act. The preamble to this act reads as follows:

It is hereby recognized that the wastage of soil and moisture resources on farm, grazing and forest lands of the Nation, resulting from soil erosion, is a menace to the national welfare and that it is hereby declared to be the policy of Congress to provide permanently for the control and prevention of soil erosion and thereby to preserve natural resources, control floods, prevent impairment of reservoirs, and maintain the navigability of rivers and harbors, protect public health, public lands and relieve unemployment.

This was an eventful step, and it started an action program on the land that is without parallel in American history. By 1937 the states began passage of soil conservation district laws. Each state now has such a law on its books, and 1,940 districts have been organized, embracing more than a billion acres of land. More than three-fourths of all the farms and ranches in the United States are now within the boundaries of such districts, which are still forming at the rate of 15 to 20 per month. Within a district, local farmers or ranchers develop a program of soil and water conservation, in the application of which technical assistance is made available from local, state, and Federal agencies. The record of these soil conservation districts is an amazing illustration of democracy in action and the practical application of scientific knowledge to human problems and their solution.

Let us now look at two or three of the fundamental concepts on which actual programs of soil conservation are based. As already noted, soils differ from place to place. They vary with slope and other natural conditions. Furthermore, they have been influenced tremendously by the use which man has made of them.

Land Capability Classification

If we are to control erosion and accomplish soil conservation, it is necessary, first of all, to have at hand an analysis of land conditions as an index of the kind of use that can be made of the land. Such an analysis should provide a classification of land on a scale large enough that it differentiates parcels of land within an individual farm or ranch. To arrive at such a classification, we delineate, on an aerial photograph, the kind of soil, slope of the land, kind and degree of erosion damage, overflow hazards, wet areas, and such features as field and pasture boundaries, houses, roads, and streams. This map is made on a scale of four or eight inches to the mile.

When these data are mapped, and considered in the light of the local climate, they form a basis for working out a classification of land according to its capacity for use. Definite combinations of soil, slope, and erosion are assigned to a capability class. As a result of considerable experience, it has proved most practicable to group types of land into eight classes, ranging from the best and most easily cultivated land (Class I) to land that is not suitable for cultivation, grazing, or forestry, but is valuable primarily for wild life, recreation, and watershed protection (Class VIII).

The Land Capability Classification scheme is outlined briefly in eight categories as given in the table at the top of the next column.

The general descriptions of the land classes may be amplified and refined, within the basic concept, to depict more accurately the specific kinds of land in each locality. Moreover, the land capability classes are too broad for detailed recommendations or specific treatments. It is necessary to establish treatment units (sometimes called use-management groups) within each land capability class. A treatment unit includes a specified range of soil properties, slopes, stages of erosion, and other land factors. Recommendations for utilization and treatment are then based upon the unit within the capability class.

Brief General Descriptions of Land Capability Classes

Class

Land Use

SUITED FOR CULTIVATION

- I Very good land; few or no limitations in type of use; can be cultivated safely with ordinary good farming methods.
- II Good land; moderate limitations or hazards; can be cultivated safely with simple easily applied or moderate conservation practices.
- III Moderately good land; severe limitations or hazards; can be cultivated safely with intensive treatments.
- IV Fairly good land; very severe limitations or hazards; suited for some forms of limited cultivation or for limited choice of crops.

NOT SUITED FOR CULTIVATION BUT SUITED FOR GRAZING OR FORESTRY

- V Not more than slight limitations, except those imposed by the needs of desirable grass or tree vegetation.
- VI Moderate limitations.
- VII Severe limitations.

NOT SUITED FOR CULTIVATION, GRAZING, OR FORESTRY

- VIII Suited for wild life or recreational use, or for watershed protection purposes.

The land capability class determines the most intensive use to which a parcel of land can be subjected without deterioration of that land. For each capability class, particular land-use practices are applicable. On Class I land, for example, practices such as the use of fertilizers and simple crop rotations may be sufficient to keep the land productive and prevent it from eroding. On Class III land, however, carefully designed terraces and water-disposal systems, in combination with strip cropping, long rotations, and other conservation practices, may be essential to hold the soil in its proper place.

The Co-ordinated Approach

The soil conservationist must deal with land-use practices applicable to all classes of land — cropland, pasture, range, woodland and wild-life land under various conditions of use. Because of this, soil conservation becomes the meeting ground of many fields. In this activity, engineering, biology, forestry, agronomy, economics, and many other spheres of human endeavor are focused upon one problem — soil erosion. The need for co-ordinated effort was expressed in 1934 by the chief of the Soil Conservation Service, Hugh H. Bennett, when modern soil conservation was still very new. The principle he declared is one of the outstanding characteristics of this new profession of soil conservation. He said:

Here is the first attempt in the history of the country to put through large-scale, comprehensive erosion and flood-control projects, applying to complete watersheds from the very crest of the ridges down across the slopes to the banks of streams and thence to their mouths. These are not engineering projects or forestry projects or cropping projects
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Take a Number

*Sometimes the Stimulation of Monetary Rewards
Brings Forth Unexpected Results in Mathematics
but Seldom Is That Science Advanced as a Result*

By WILLY LEY

MOST scientific work is undertaken and accomplished for the sake of knowledge, the love of truth, and the glory of discovery. Nevertheless it is by no means detrimental to the progress of science that there is such a thing as the Nobel Prize. It is also quite pleasant to know that the Nobel prizes are not the only ones in existence; they are merely the highest awards for outstanding achievement. There are other and smaller awards for lesser accomplishments.

But even the laudatory custom of awarding cash for accomplishment can miscarry, as was proven, for example, in the Wolfskehl Prize. The prize itself brings us to the core of this story. The reason for establishing the prize, however, lies a few centuries back and has to do with the habits of the well-known French mathematician, Fermat.

Pierre Fermat lived from 1601 to 1665 and was the King's councilor in the local Parliament of Toulouse. Mathematics was his hobby, not his profession. But he is now considered the founder of the theory of numbers. He came very close to being the inventor of differential calculus and had a hand in establishing methods for calculating probabilities. As for his official duties, he seems to have discharged them well.

After having finished with being the King's councilor for the day — rarely strenuous work, one would guess — he would sit in his garden and read mathematical works. When new thoughts came to him, while reading, he would scribble notes on the margins. These notes were later published and quite naturally it is impossible to date them properly.

In 1621 Fermat purchased a new French edition of the *Arithmetica* of Diophantus of Alexandria, originally written during the Third Century. Now it was known in Diophantus' time that a right-angled triangle with the sides 3, 4, and 5 (also called Egyptian triangle) fulfilled the equation, $3^2 + 4^2 = 5^2$. Diophantus apparently wondered whether this applied to these three integers only and quickly found out that there is a very large (actually infinite) number of similar triplets. Generally then, in such triangles, it held true that $x^2 + y^2 = z^2$. Reading this, Fermat wrote on the margin: "... it is impossible to separate a cube into two cubes, a fourth power into two fourth powers, or, generally, any power above the second power into two powers of the same degree. I have discovered a truly marvelous demonstration which this margin is too narrow to contain." The date of this note is not known with certainty, although it must have been written after he bought his copy of the book.

If Fermat wrote down this proof elsewhere it has never been found. After his death, and after his many marginal notes were published, the problem was there.

The equation $x^n + y^n = z^n$ has no solution if n is larger than 2. Every so often a mathematician would tackle this problem. The great Euler who lived from 1707 to 1783 proved that no solution (in whole integers) existed for $x^3 + y^3 = z^3$ and for $x^4 + y^4 = z^4$. Peter Gustav Dirichlet (1805–1859) then proved the impossibility for $x^5 + y^5 = z^5$.

These proofs were very useful, but they were not general proofs. Taking Fermat's statement at face value it should be possible to prove generally that the equation would not work for *any* number higher than 2. Euler and Dirichlet might have tackled the problem in much too complicated a manner. What a pity that Fermat did not carry a notebook out into his garden along with the books he took to read. He had irked mathematicians in precisely the same manner in a number of other instances, but they had always succeeded in finding the proofs that Fermat had failed to write down. This case became an exception.

Still, it remained a family matter among mathematicians until the year 1908. In that year a German mathematician, Professor Paul Wolfskehl, who had also worked on that proof without any success for a number of years, left the sum of 100,000 marks (roughly \$23,500) for a general proof of what had become known as Fermat's last theorem. The news spread quickly, far and wide. The local mailman in Göttingen asked to be motorized* and the institute administering the Wolfskehl Prize quickly began to doubt the wisdom of the measure. Needless to say, the lure of 100,000 marks in gold was at least one major reason why a number of competent mathematicians suddenly took interest in the Fermat theorem. But the prize also caused innumerable laymen to devote their spare time to the problem. One of the solutions, I have been told, consisted of giving one numerical example for each power from 2 to 200; others were even more simple than this.

After awhile, when the 100,000 marks had begun to produce some interest (the financial kind at so much per cent per annum) the Institute began to hand out consolation prizes for partial proofs. Partly because of the Wolfskehl Prize, the matter has now progressed to the point where there are proofs of Fermat's theorem for any value of n up to 269, but a general proof is still lacking. It is easy to understand why a number of mathematicians feel that Fermat made a mistake, and that there is no general proof. As for the Wolfskehl Prize, it died during the German inflation. Even if Fermat did not make a mistake, and even if somebody should find the general proof now, the honor (and

* This was not done. The horse-drawn parcel post wagon made a daily delivery instead.

probably a professorship) will have to be reward enough for the discoverer.

In the course of the investigations which had been initiated and stimulated by Fermat's marginal note, disposal was quietly made of a famous problem of antiquity. It was the problem of doubling the cube. The story goes that an epidemic disease raged in Greece in about 400 B.C. and that Apollo's oracle promised the end of the disease if the altar in the temple were doubled in size. That order seemed simple of fulfillment but even after the new altar had been built the epidemic did not stop. Then the oracle announced that the order had been misunderstood. The original altar had been a cube; the new altar was to be a cube, too, except double the size of the original. This order could not be obeyed exactly and although the epidemic evidently waned, after awhile, the problem remained to be solved.

If we designate the side of the cube by a , the volume of the cube will be $v = a^3$. A second cube whose volume, V , is double that of the first would have a volume of $V = 2v = 2a^3$ and the length of its side would consequently be $a^3 \sqrt[3]{2}$. Since $\sqrt[3]{2}$ is an incommensurate number, the sides of the new cube cannot be measured exactly and consequently a second cube, whose volume is double that of the first cannot be constructed. Since this problem was recognized (and disproved) before Nobel and Wolskehl began to excite the imagination with heaps of gold pieces, no financial interest was ever involved in that problem.

Prime Interest

There was once another prize, even if only a small one of 1,000 German marks, that had to do with the construction of prime numbers. It, too, probably vanished during the inflation but it stirred up considerable interest in another phase of mathematics.

A prime, as everybody knows, is a number which has no divisors except itself and 1. Prime numbers, needless to say, caught the fancy of even the earliest mathematicians and Eratosthenes of Cyrene (who was the first to attempt to measure the size of the earth and found a figure remarkably close to the truth) devised what is still called the sieve of Eratosthenes. It consists simply in writing down the integers 1, 2, 3, 4, 5, . . . , and then striking out all multiples of 2, then all multiples of 3, and so on, until only the primes are left. In the first hundred they are: 1, 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, and 97.

The sequence looks quite irregular, but it seemed as if there ought to be some hidden order in the appearance of primes; it merely remained to find it. Obviously, primes became rarer the higher one went along the line of the positive integers. The same applied to the so-called "pairs" which are two primes separated only by one even number, like 11 and 13, 41 and 43, or 71 and 73. The first question was: "Will the primes stop somewhere, in the region of very large numbers?" That question had been disposed of early by Euclid.

"Let's imagine," he said, "that there is a largest prime which we'll call P . Now we multiply all known primes $1 \times 2 \times 3 \times 5 \times 7 \times 11 \times 13 \times 17 \times 19 \dots$

and so on, until we come to P . The product of all these integers, a number very much larger than P , we shall call Z . Now $Z + 1$ either is a prime or it is not: If it is, we have a prime larger than P ; if $Z + 1$ is not a prime, the divisor cannot lie between 1 and P , since there would then be a remainder, 1. Therefore, the divisor would have to be an integer between P and $Z + 1$. Since that divisor would have to be a prime itself it would also be a prime larger than P ."

Since Euclid had proved that there was no highest prime, it was natural to look for a similar proof that there was no highest pair of primes. Apparently, such a proof has still to be found, but it was felt that this proof might be derived as a kind of by-product from a formula which permitted the construction of very large prime numbers.

Fermat believed that he had found such a formula. He was in error, however, which is the main reason for the skepticism with regard to the proof for his last theorem. Fermat had thought that the equation, $2^x + 1 = P$, where P is a prime number, would produce primes, provided that the x was of the form 2^n with n a positive whole integer. The first few steps yield the following primes:

$$\begin{array}{rcl} 2^2 + 1 & = & 5 \\ 2^{2^2} + 1 & = & 17 \\ 2^{2^3} + 1 & = & 257 \\ 2^{2^4} + 1 & = & 65,537 \end{array}$$

Unfortunately, the next step miscarried. $2^{2^5} + 1$ (or $2^{32} + 1$) is 4,294,967,297 and Euler proved that this is divisible by 641. The next number in the sequence is 18,446,744,073,709,551,617 which is not a prime since it is divisible by 274,177. Two formulas, developed after Fermat, also produce primes for awhile. For example, $n^2 - n + 41$ produces primes for any value of n up to 40. The 41st step turns out to yield a square, not a prime. Similarly, the formula $n^2 - 79n + 1601$ produces primes for n up to 79 and breaks down at the 80th step.

No Prize

The problem of a formula for a construction of large primes is still unsolved. Possibly the proof should go the other way round and show that such a formula is impossible. At any event there is no longer a prize for finding prime numbers.

The attempt to find a formula for the construction of large primes was not the only contribution which Fermat made to this problem. He stated, for example, that a number of the form $n^p - n$ is divisible by p if n is any whole number and p any prime. If, for example, $n = 15$ and $p = 3$, we get $(15^3 - 15) = (3375 - 15) = 3360$ which is divisible by 3. Fermat left no proof, but that was supplied by Leibnitz.

Another one of Fermat's proofless assertions (but he wrote that he had a proof) was the statement that any prime of the form $4n + 1$ is the sum of two squares and only one set of two squares. Let us consider any multiple of 4, such as 40, for example, and add one. If the result (41) is a prime (which is the case) it must be the sum of two squares in just one way. It is,

(Continued on page 248)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

For Merit

THE highest honor that can be bestowed on a civilian in recognition of outstanding service to the nation — the Medal for Merit — has been awarded to George R. Harrison, Dean of the School of Science at M.I.T. The medal was presented to Dr. Harrison on December 31, 1948, by Karl T. Compton, chairman of the Institute's Corporation and chairman of the Research and Development Board of the National Military Establishment in Washington.

The award was made in recognition of Dean Harrison's services as a scientist during World War II. He earlier received the Medal of Freedom for his war services. The citation accompanying the medal, which was signed by President Truman, follows:

"For exceptionally meritorious conduct in the performance of outstanding services to the United States from July, 1940, to June, 1946. Dr. Harrison, as Chief of the Division of Optics and Chief of the Division of Physics of the National Defense Research Committee, and as Assistant Chief of Field Service of the Office of Scientific Research and Development, was among the first of the Nation's senior scientists to recognize the need for vigorous concentration on the development of new weapons and improved methods of warfare. Early foreseeing the importance of guided missiles, he initiated the project which resulted in the azon and razon dirigible bombs. His recognition of the potentialities of infra red rays resulted in prompt development of the metasopes and of equipment for signalling in secrecy; and of the long wave equipment for the detection of enemy personnel, vehicles and ships. He guided the development of optical equipment, notably reflex gun sights and high altitude high resolution aerial cameras with great effectiveness which resulted in providing much improved equipment to the armed services. Through Dr. Harrison's unceasing and selfless efforts, he was responsible for organizing, initiating, stimulating and personally guiding research and development investigations culminating in equipment and methods which saved the United States many lives, and increased our effectiveness in the war."

Dr. Harrison joined the staff of M.I.T. as professor of physics in 1930, and has been dean of the School of Science since 1942. He traveled widely in New Guinea and Australia on scientific missions during World War II.

Modern Alchemist

MEDIEVAL alchemists were primarily occupied with the problem of converting base substances into noble metals (principally gold) of high intrinsic value. Of course they were doomed to failure, and it is only during the Twentieth Century, when artificial transmutation became possible, that anything like the alchemists' dreams could be said to have come true.

But one great lesson which research teaches is that valuable by-products, which at first seem to have no apparent connection with the problem at hand, often come from the pursuit of worth-while causes. It is pleasant to record, therefore, that one of the Institute's modern alchemists has created gold out of something much less tangible than the brewing concoctions which, centuries ago, were thought to yield the yellow metal. What is more, two varieties of gold have been produced. One of these — and the more valuable of the two — is a rather intangible, colorless substance of such subtle properties that it is not listed in the periodic table; it is the direct outgrowth of a life of teaching, research, and professional activity. The second variety — the customary yellow metal of atomic weight 197 and entered as element 79 in the periodic table — has been produced in small quantity as a by-product of the first.

The by-product was announced by Lawrence H. Flett, '18, President of the American Institute of Chemists, in a statement that Warren K. Lewis, '05,



M.I.T. Photo
As chairman of the Research and Development Board of the National Military Establishment in Washington, Karl T. Compton awards the Medal for Merit to George R. Harrison, Dean of Science.

Emeritus Professor of Chemical Engineering at M.I.T., has been unanimously selected to receive the 1949 gold medal of the American Institute of Chemists. The award is made annually for "noteworthy and outstanding service to the science of chemistry or the profession of chemist" and has been made this year in recognition of Dr. Lewis' administrative ability, leadership, and outstanding success as a teacher. Presentation of the medal to Dr. Lewis will be made at the annual meeting of the American Institute of Chemists to be held in Chicago on May 6 and 7.

The pioneering work in chemical engineering which Professor Lewis has done since his graduation from the Institute in 1905 has brought him other honors as well. In 1937 he was awarded the honorary degree of doctor of science from the University of Delaware, and Princeton University awarded him the degree of doctor of engineering in 1947. In 1936 Professor Lewis was awarded the Perkin Medal of the Society of Chemical Industry for valuable work in applied chemistry, and in 1947 the American Chemical Society awarded him the Priestley Medal. Professor Lewis was voted one of the "ablest chemists and chemical engineers working in the United States" by the Chicago Section of the American Chemical Society, and in February, 1948, he was awarded the President's Medal for Merit with the following citation:

"For exceptionally meritorious conduct in the performance of outstanding services to the United States during the recent war period. Dr. Lewis, as a member of Division II of the National Defense Research Committee, contributed a singularly great service to the war effort in organizing and inspiring the chemical engineering activities of the Committee on the problems of the Chemical Corps, especially those connected with gas masks, canister design, and the theory of aerosol generators and filtration. Dr. Lewis' services in this field and in connection with chemical engineering problems in the development of the atomic bomb were of inestimable value to the ultimate victory."

Technology Alumni who were previous recipients of the medal of the American Institute of Chemists are: Robert P. Russell, '22, of the Standard Oil Development Company; and Charles A. Thomas, '24, of Monsanto Chemical Company.

Inauguration and Mid-Century Convocation

CAMBRIDGE will be the scene of events of international importance, and a new chapter in M.I.T. history will begin this spring, when James R. Killian, Jr., '26, will be inducted as the Institute's tenth president. Prior to the inauguration, on March 31 and April 1, the Institute will conduct a Mid-Century Convocation on the Social Implications of Scientific Progress in celebration of this administrative change.

With the United States emerging as the leader in science and technology after World War II, and with M.I.T. playing an outstanding part in the nation's scientific and engineering progress, it is appropriate that President Killian's inauguration provide opportunity to survey the progress which has been made in science and technology during the Twentieth Century.

And, since our social and political institutions have been literally revolutionized as a result of applied science during the last five decades, it is especially appropriate that the social implications of science come into focus. With this thought in mind, the convocation has been planned to provide opportunity for scholars in various branches of learning, and from all parts of the world, to examine and assess the progress of science since the electron was discovered, to deal with the tremendous changes which scientific progress has wrought in our social, economic, and political institutions in the same period, and to deal with the role of the individual in a society of ever increasing complexity. Scholars from various parts of the world have been invited to take part in this program which holds promise of significance in forecasting the trend of events for the second half of the Twentieth Century.

Climax of the three-day celebration will be the colorful pageant in which Karl T. Compton, chairman of the M.I.T. Corporation, will induct Dr. Killian as the Institute's new president. Leaders in science, engineering, and higher education, as well as many Technology Alumni, will attend the inauguration ceremonies, the last one of which was held in 1930 when Dr. Compton became president. As the program is further developed in the weeks to follow, additional details will appear in *The Review* which will also publish a full account of the events of March 31, April 1, and 2 in the May issue.

Graduate Study for Executives

TEN young executives from various fields of business will be chosen in a national competition for a year of graduate study in the Sloan Fellowship Program for Executive Development at M.I.T., James R. Killian, Jr., '26, President of the Institute, announced in January.

The opening of the competition marks the resumption, after a recess during World War II, of a program which started in 1931, and has been supported for several years by grants from the Alfred P. Sloan Foundation, Inc. This program is a joint project of the Institute's Departments of Business and Engineering Administration, and Economics and Social Science. The award of 10 fellowships this year is made possible by a new grant of \$225,000 from the Foundation to cover a program of research in the field of executive development and education for a group of outstanding young business executives.

Gerald B. Tallman, Associate Professor of Marketing, of the Department of Business and Engineering Administration, is director of the Sloan Program and will supervise the selection of the fellows and their work during their year in residence at M.I.T. In discussing the objectives of the program, Dr. Killian made the following statement:

Informed and thoughtful business leadership is of great importance in our industrial society. Increasingly, top executives must balance policies and programs to serve equitably all of the participants in the enterprise, thereby enhancing the survival values of our democratic industrial system. The Sloan Fellowship Program for Executive Development was originally founded in recognition of the increasing need for business leaders with a fundamental un-

President James R. Killian, Jr., '26, was the recipient of honors in the City of Brotherly Love on December 14 when Drexel Institute of Technology conferred upon him the honorary degree of doctor of engineering, in ceremonies recognizing the leadership of three outstanding educators. Shown here, left to right, are Harold E. Stassen, President of the University of Pennsylvania, James R. Killian, Jr., M.I.T. Head, and Louis P. Hoyer, superintendent of Philadelphia public schools — all of whom received honorary degrees from James Creese (extreme right), President of Drexel Institute of Technology.



The Photo-Illustrators

derstanding of the broader and longer-term phases of management and of the economic and social background within which business operates.

The program continues to maintain, as its primary objective, the rapid and more adequate preparation of capable young executives for positions of higher responsibility in industry. The objectives of this program are accomplished through the close association of a small group of exceptionally able men, studying and evaluating business problems and underlying socio-economic forces, in an environment rich in both stimulation and resources.

The fellowships, awarded on the basis of merit in a nation-wide competition, will carry stipends up to \$4,000 for married men and \$3,000 for single men. Recipients, on leave of absence from their employers, will be in residence at the Institute from June 10, 1949, to June 15, 1950, and will engage as a group in a special program. In selecting the total group of approximately 10 fellows, an attempt will be made to have represented a diversity of industries, size of companies, geographic areas, and types of experience. In describing the Sloan Fellowship Program, Professor Tallman said:

The courses to be undertaken by the fellows are designed to capitalize upon their maturity and background and to offer an experience not otherwise readily obtainable by the young executive in industry. The practical problem approach is supplemented by study of underlying principles in the consideration of such problems as industrial relations, financial management, marketing methods and research, production, and accounting.

The work of the fellows also emphasizes in a practical way the responsibilities borne by industry in our economic and social activities and the effects of industrial operation upon other parts of the social structure. The better appreciation of the varying objectives and points of view of different elements in our society provides a foundation of understanding for intelligent administration of the individual business enterprise and for adjustment to new circumstances and attitudes as they arise.

The program does not attempt to develop experts in specific functional phases of business activity or in specific

industries; rather, the thinking of the fellows is carried beyond the bounds of their own specialized activities and experiences. When attention is directed to problems and methods within the various functional divisions of an enterprise, their relation to other functions and to the overall operation is emphasized. When economic, social, or governmental problems are studied, their effect upon the administrative planning for the business enterprise is given major consideration.

The educational responsibility for this program rests with the Department of Business and Engineering Administration and the Department of Economics and Social Science. To supplement the educational resource of these departments, an important contribution is made by a distinguished group of industrial, government, and labor leaders meeting with the fellowship men in seminars at the Institute and in field trips away from the Institute.

Report on Student Activity

LAST year the Corporation passed a resolution proposed by the Visiting Committee on Student Activity* which read as follows:

Resolved, That it is in the interests of a sound educational program at M.I.T. to provide: (a) Dormitories adequate to accommodate the maximum number of students consistent with the housing needs of the student body and a stabilized enrollment at the Institute. (b) Athletic and recreational facilities adequate to accommodate all reasonable needs of student and faculty members who may wish to use them and to permit intercollegiate competition. (c) Facilities adequate for the conduct of extracurricular activities. (d) Administrative personnel adequate for the guidance and encouragement of student activities and athletics and of a balanced extracurricular program for the student body. (e) Freshman participation in athletics as a part of the educational program.

Resolved Further, That maximum benefit from activities, including athletics, will be attained only when the students assume full responsibility for the operation of these

*Members of this Committee for 1947-1948 were: Donald F. Carpenter, '22, chairman, Marshall B. Dalton, '15, H. W. McCurdy, '22, and J. Willard Hayden.

activities, the Administration and the Alumni Association assisting in an advisory capacity only, except in such cases where more direct action may be required to protect the reputation or properties of M.I.T. or to avoid any possible detrimental effect on the educational program.

Resolved Further, That the Administration and Executive Committee of the Corporation give these objectives serious consideration in the allocation of operating and capital funds.

The report of this Committee is largely one of comment upon progress which has been made in carrying out these recommendations.

Construction on a new dormitory, which is to be a Senior House, is now well along. This addition to our housing facilities will be available by the opening of the fall term in 1949. This dormitory will add accommodations for 362 students. This is a major step ahead in housing students at the Institute, but the Committee looks forward to the provision of additional dormitory units so that the Institute may ultimately meet all the demands on the part of the student body for dormitory accommodations.

The new Rockwell Athletic Cage was dedicated last June and makes a major addition to our athletic facilities. This structure, described in the November, 1948, Review, will enable the Institute, for the first time, to have an adequate indoor athletic program.

During 1947-1948, new tennis courts were completed in the area west of Massachusetts Avenue, and some progress was made in the further development of the playing fields in this area. Much remains to be done, however, to utilize fully the remaining land for playing purposes. This will require funds totaling ultimately about \$70,000 which are not now available.

Progress has likewise been made in providing improved facilities for nonathletic activities at the Institute. Student lounges on the east side of Walker Memorial, including the balcony, have been refurnished and redecorated, with the result that they provide a much better environment for student use. The Litchfield Lounge on the first floor of Walker has been so arranged that it serves as a dignified setting for meetings of the Institute Committee, and the entrance to this room has been fitted out so that it serves as an office for the Institute Committee. A full-time secretary has been engaged to do the secretarial work of the Committee, and this office provides an adequate place for her work. The year also witnessed the completion and intensive use of the new Pritchett Lounge in Walker Memorial, a room designed and decorated to provide a place where students can enjoy bringing their friends and which they can use for other social purposes. The extent to which the students have made use of this lounge has justified the recommendation of this Committee several years ago that such a place be made available to our students.

Not quite half of the student body participated in athletics and other undergraduate activities in 1947-1948, so much remains to be done to extend recreational and athletic facilities at M.I.T., and plans have been developed for the ultimate facilities which will be needed. These include a gymnasium, an auditorium, and a faculty club, all of which would contribute importantly to providing proper environmental conditions at the Institute.

Important additions have been made to the administrative personnel, available for the guidance and encouragement of student activities, and of a balanced extracurricular program. Along with the appointment of Everett M. Baker, Dean of Students, an additional man has been added to the staff of the Office of the Dean of Students. At the opening of school in the fall of 1947, the Institute had, for the first time, a full-time director of athletics, and during the year the new Athletic Board, appointed by the president, has been created as a part of the administrative organization of the Institute. This Athletic Board, made up of representatives of the Faculty, the Alumni, the Administration, and the student body has replaced the Alumni Advisory Council on Athletics. The new athletic director has made great progress in developing a sound program of intercollegiate competition and an extensive intramural program. Additional funds provided by the Institute will enable him this next year to increase the coaching staff.

Another important addition to personnel has been the appointment of a director of musical activities, who co-ordinates work in the classroom and all the extracurricular musical activities. Under his stimulating guidance, there has been greatly increased participation by students, and we now have a flourishing symphony orchestra and glee club. The program has developed so that still additional personnel must be engaged to assist the director.

In addition to an increase in the funds available from the Institute for undergraduate activities, the Executive Committee approved an increase in the student fee for next year, so that the amount appropriated out of each tuition payment will now be \$9.00 instead of \$7.00 a year.

Early in the past academic year, the Faculty approved a program of compulsory athletics for freshmen, as recommended by this Committee.

Perhaps of more importance than these various developments has been the fine attitude which has been built up among the student body and the staff. Reports indicate that this year student government at the Institute, now completely recovered from World War II, operated with great effectiveness and that the principle of self-government was extended in several ways. The fraternities, through the Inter-fraternity Conference, have made steady progress in dealing with the co-ordination of fraternity activities at the Institute. The Institute Committee has increased its prestige, and experiments have been undertaken by the students themselves in working out an honor system for quizzes and examinations. During the year most members of the Faculty took responsibility for acting as friendly counselors for half a dozen freshmen each. In addition, the service and influence of the registration officers were extended.

Military Review

AN unusually pleasant dinner meeting in Boston on December 1, 1947, provided a background for a discussion of the problem of integrating the Reserve Officers' Training Corps program into the curriculums of the highest ranking engineering and scientific in-

(Continued on page 232)

BUSINESS IN MOTION

To our Colleagues in American Business ...

This is the story of a briefcase with a new combination lock. In fact, it is the story of a growing line of leather goods bearing the lock. The people who carry that luggage probably are conscious of nothing except that it looks very well indeed, and that the combination lock is new in design, easy to operate, and entirely reliable. What more should they ask?

But there is an inside story that they would never dream of. They would never think that there is any connection between a compact carried by the ladies, and a lock on a briefcase carried by the men. But there actually is. You see, the leather goods company wanted that lock to be as near perfect as possible. Like anybody with a new idea, it was fussy about reaching for perfection. So it went to a manufacturing jeweler to have the lock made. The idea was that such a company certainly could make the lock with the necessary beauty, precision and economy. It was an excellent idea, though somewhat unorthodox from the viewpoint of those who think only in terms of what is called "normal channels of trade." It is a pleasure to report that the association has proved to be extremely successful.

Revere entered this picture because the jewelry

maker is an old customer for some of Revere's finest metals. Specifications for the lock included the use of solid brass for both exposed and operating parts for which beauty, reliability and corrosion-resistance are required. Die castings and also steel are used in their appropriate places, thus again demonstrating that there is no one metal suitable for every use, but that each metal has its proper field. Incidentally, solid brass is not only used in the lock, but also in the handle posts.



This case of the combination lock interests Revere not only because it uses Revere brass for quality, but because it represents a lot of imagination in selecting a fabricator. If a jewelry firm can make locks, perhaps a coppersmith could make earrings, and diversification would add to the security

and profits of both. Imagination is a precious thing. Some people consider it the most important factor in business. Revere thinks it has some imagination, as have all good suppliers to business. Whatever it is you make, Revere suggests you ask your suppliers to do a little thinking with you and for you. After all, every bill you pay, as well as every one you send out, includes an inevitable charge for brains, know-how, imagination.

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THE INSTITUTE GAZETTE

(Continued from page 230)

stitutions by members of the Visiting Committee on the Department of Military Science and Tactics.* This problem has always been a difficult one. To maintain its high scholastic standards, M.I.T. prescribes a course of study and recitations which takes up nearly all of the students' available time, and which the Institute does not consider feasible to reduce. Also requiring students' time is the Army or Air Force which is required by the National Defense Act to present a course of three hours' instruction per week in basic military science and five hours per week in the advanced course. This schedule is the minimum which the writers of the National Defense Act considered satisfactory to produce second lieutenants of the Reserve Officers' Training Corps. At most colleges and universities where Reserve Officers' Training Corps units have been established, this program in military science has been accepted without alteration. At a few, where it was felt that five hours per week for the advanced course was too much for the students to carry in addition to their other studies, certain academic

*Members of this Committee for 1947-1948 were: Thomas C. Desmond, '09, chairman, C. George Dandrow, '22, Brigadier General William F. Heavey, '22, Colonel Benjamin S. Kelsey, '28, General J. Lawton Collins, J. Willard Hayden, and Major General Frank A. Keating.

subjects have been substituted for some of the Reserve Officers' Training Corps courses. This change in the students' program is permitted by the National Defense Act, if approved by the Secretary of the Army or Air Force but these compromise agreements have not been thoroughly satisfactory to either party.

It is certainly desirable that Reserve Officers' Training Corps students be given the complete course of instruction in military science, in order that they may be reasonably well qualified as reserve officers. It is equally desirable, however, that they be as thoroughly trained in engineering or scientific fields as practicable. Also, it is important that a fairly large number of men so qualified be procured as Reserve and Regular Army officers.

It is believed that an acceptable compromise agreement might be based on the following program which is proposed for consideration:

1. Acceptance, by the Army, of a program in advanced military science, to include three classroom hours per week of military science subjects.

2. Agreement, by the college or university, that students participating in such a program will be required to take instruction for two classroom hours per week in subjects to be agreed upon between the Army and the institution. Subjects in this category would fall in one of the two following classifications: (a) Subjects acceptable to all arms and services, such as Personnel Management, Psychology, Group Psychology, Man-

(Continued on page 234)



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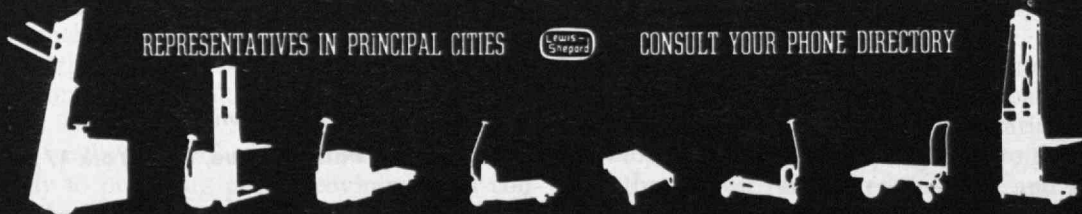
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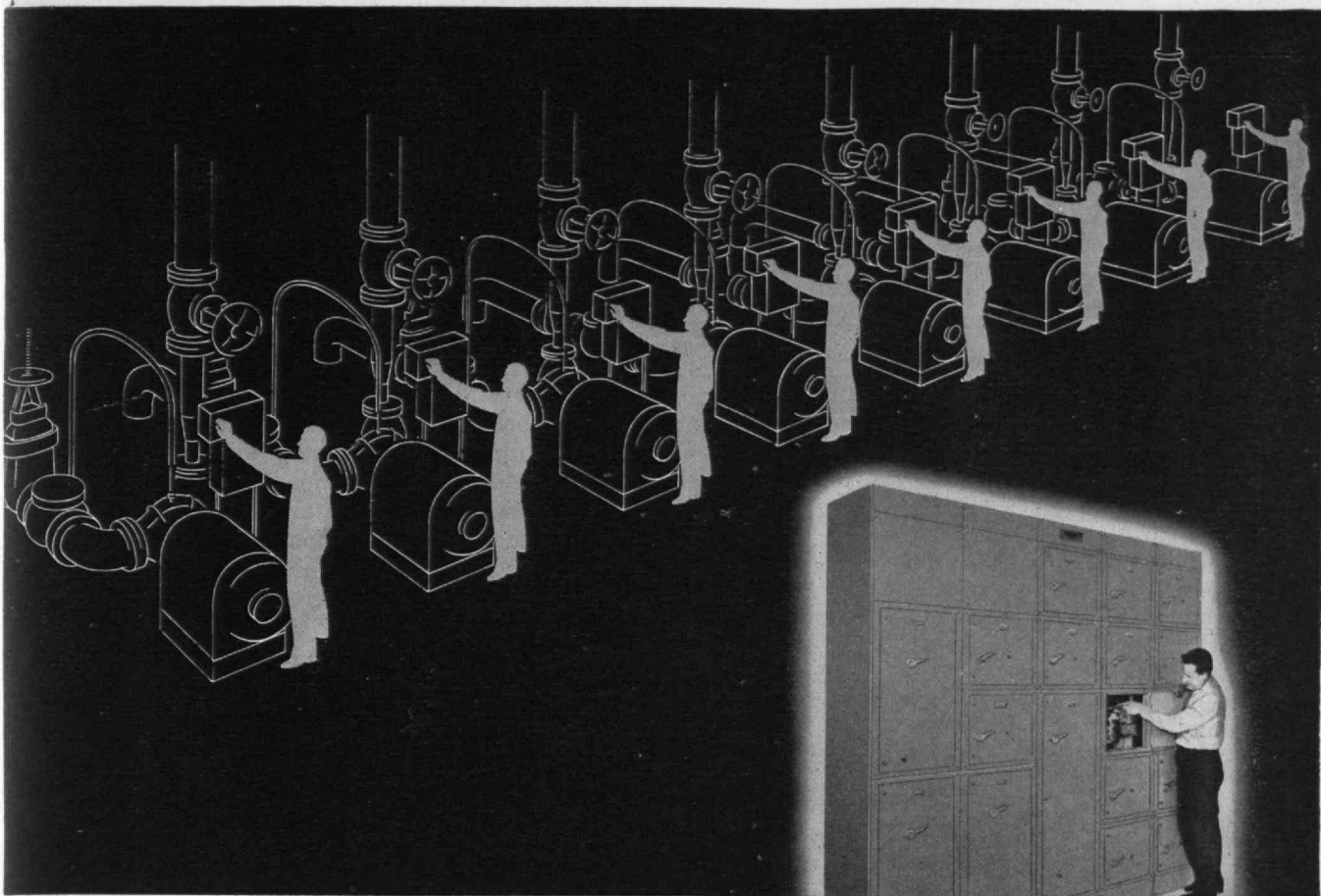
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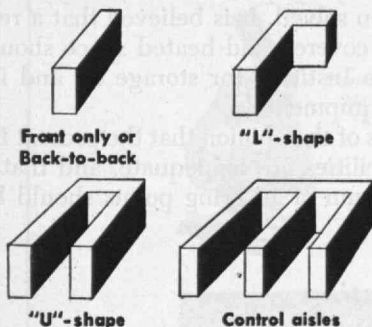


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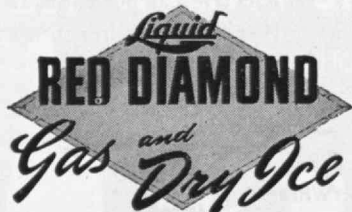
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THE INSTITUTE GAZETTE

(Continued from page 232)

agement of People, Technique of Executive Control, Industrial Relations, Labor Relations, International Relations, and Economic Principles; and (b) Technical subjects acceptable to a particular arm or service. Under such operation, the Corps of Engineers, for example, might accept such subjects as Engineering, Geology, Fluid Mechanics, Engineering Construction, Strength of Materials, and so on.

It is believed that such a program will insure that each graduate of the Reserve Officers' Training Corps will have received instruction for at least five hours per week in subjects of definite value to the Army or Air Force, including three hours' training in the prescribed Reserve Officers' Training Corps program. Officers who are trained under such a program should be well qualified.

The Army and Air Force Reserve Officers' Training Corps units at M.I.T. appear to be operating on a friendly and well co-ordinated basis; and, in the interest of economy of personnel and equipment, as well as in the interest of maintaining close and harmonious relations between the Army and the Air Force, it is believed advisable that the Army and Air Force units should continue to operate in an integrated organization as at present.

The question of increasing the length of the Reserve Officers' Training Corps summer camp from its present six weeks to eight weeks was discussed by the Committee. It is evident that any increase in the camp training period would curtail the earning power of the students during the summer. It would also probably meet with opposition from companies which now allow students in co-operative courses to attend the camp when they should be at the companies' plants, and might prevent some students from attending a second session of summer school as given by some institutions. The Committee recommends that the summer camp be maintained at its present length of six weeks.

The Committee noted that the problem of providing storage space for heavy equipment and artillery weapons has not yet been solved. It is believed that a reasonable amount of covered and heated space should be provided by the Institute for storage of, and instruction in, such equipment.

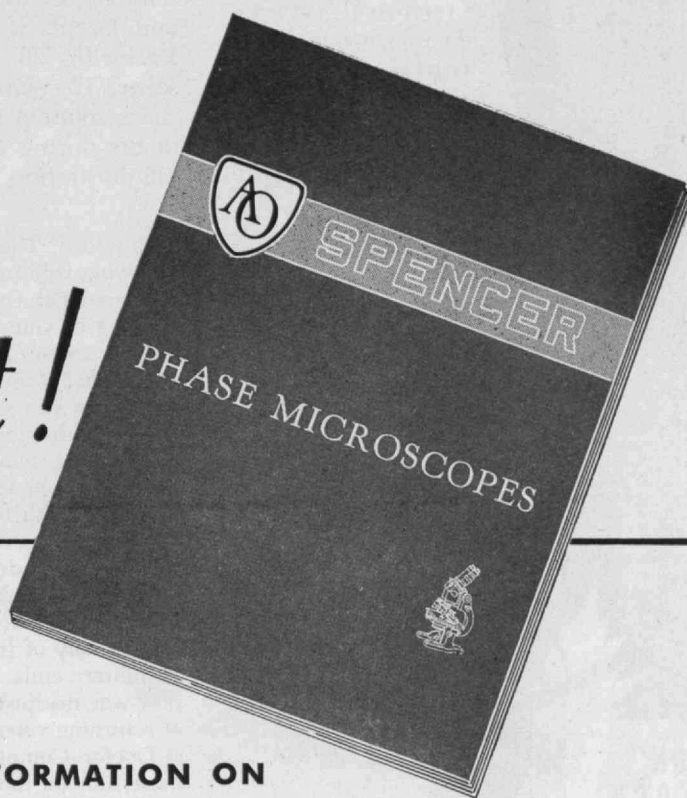
The Committee is of the opinion that the present indoor rifle range facilities are inadequate, and that a range with a minimum of 10 firing points should be provided at M.I.T.

Faculty Resolution

UPON the retirement of Karl T. Compton as president of M.I.T. and his assumption to his new post as chairman of the Institute's Corporation, the M.I.T. Faculty adopted a resolution setting forth their appreciation of the splendid accomplishments which have been achieved under President Compton's administration. Prepared and signed by Professors Wil-

(Concluded on page 236)

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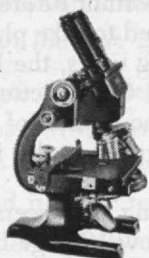
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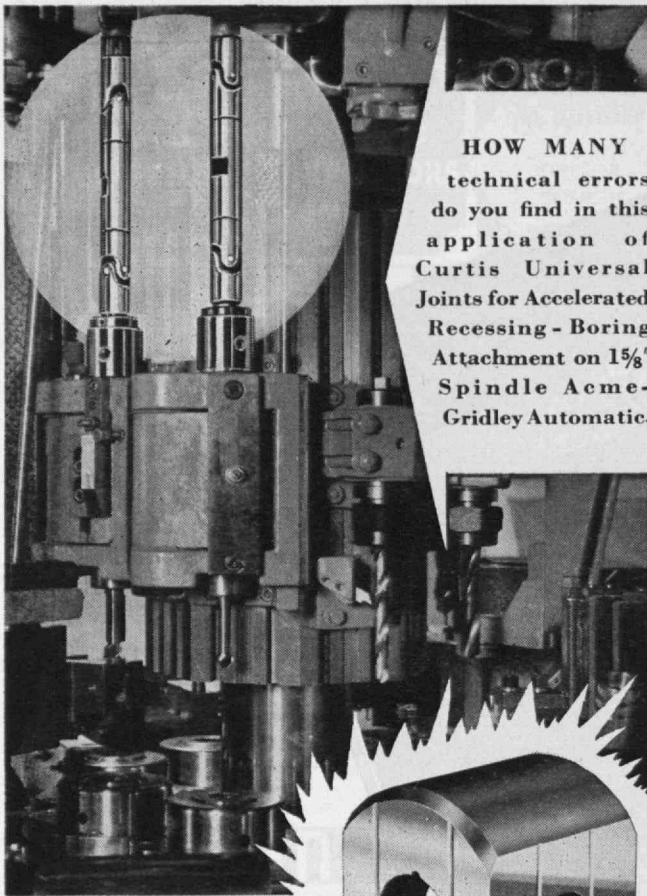
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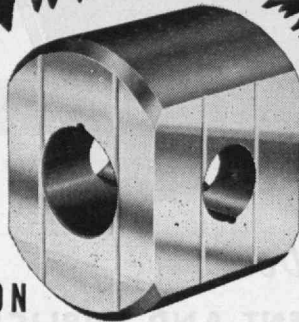
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liam H. McAdams, '17, as chairman of the Faculty, and Joseph S. Newell, '19, as secretary, Herbert L. Beckwith, '26, William C. Greene, Jerome C. Hunsaker, '12, Warren K. Lewis, '05, and John C. Slater, the resolution sets forth a summary of accomplishments during the 18 years of President Compton's administration. The resolution reads, in part, as follows:

Resolved, That the Faculty do adopt and approve the following tribute to President Compton:

Since 1930, Doctor Compton has been our leader in the training of young men for professional careers in architecture, science and engineering, and in research to extend the applications of science.

He has also served as the administrator of a complex and expanding universe of facilities and people. With bold imagination, tempered with wisdom and humor, he has led us through a period of sound growth.

This growth took place under stormy but stimulating conditions. His inauguration took place at the beginning of the severe industrial depression of the 1930's which was soon to be complicated by social changes under new legislation. Then came war to take away most of the student body, many of the faculty, and to divert our laboratories to military ends. Finally, the Institute was to weather the post-war readjustment, with inflation of costs and a flood of returning veterans.

Doctor Compton guided the Institute safely through these difficult times, not only with its independence unimpaired, but materially strengthened and immensely elevated in prestige.

In eighteen years the faculty has grown with the facilities at their disposal from 240 in 1930 to 398. The educational plant has increased from a value of some \$14,000,000 to nearly \$20,000,000, total endowment funds from \$33,000,000 to \$48,000,000. The student body, in spite of ever higher standards of admission, has increased from 3200 to 5600. Emphasis on higher professional training is to be noted in the relative growth of the graduate school. In 1930 17% of the students were enrolled in the graduate school. In 1948, this proportion is 27%.

For Construction Industries

WITH an eye to the important future developments which may be expected to take place in building construction in the coming years, the Department of Building Engineering and Construction has issued a pamphlet setting forth the details of the course of study which the Institute offers in this important field of engineering.

Under the title "Training Engineers for the Construction Industry," the new 16-page brochure states the objectives of the undergraduate and graduate Courses in Building Engineering and Construction, outlines the program of study, and includes a description of the subjects currently offered.

Copies of the pamphlet have already been mailed to many actively engaged in work in the building and construction industries. Additional copies may be obtained on application to Professor Walter C. Voss, Head of the Department of Building Engineering and Construction at the Institute.



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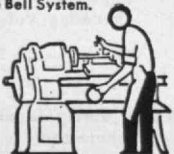
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SYSTEM SINCE 1882

THE PRICE OF HASTE

(Continued from page 219)

Americans safer air transportation. What should the air lines do?

First of all, they should emphasize safety rather than schedule. Air travel can save a busy man an enormous amount of time. It can save him much discomfort and inconvenience. It can enable him to accomplish things impossible in any other way. But it cannot yet assure him that he can fly from Boston to Washington at a specified time three weeks hence and do it in safety. To attempt fulfillment of false promises as to the maintenance of a schedule in all weathers with present equipment is to court disaster.

Then the air lines should equip their airplanes as rapidly as possible with ILS instruments and airborne radar of the type which warns a pilot of an obstacle, such as a mountain top, in his path. Pilots should be trained intensively in the use of these instruments. The weight of the ILS instruments and radar set may reduce the capacity of a plane by one or two passengers, but the equipment will materially improve the life expectancy of the passengers carried.

The air lines and their representatives should co-operate fully with governmental agencies seeking to improve the safety of air travel. It is disappointing to hear of the representative of the Air Transport Association of America on the President's Air Safety Board refusing to sign the report of the Board because it dealt broadly with the entire question of air safety

and did not confine itself to the three much publicized crashes in May and June, 1947.

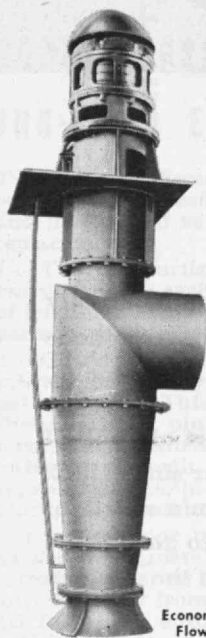
The air lines should hasten to use the best fields and terminal facilities available in the communities they serve; and they should not attempt to serve communities having inadequate fields. When new and improved fields become available at our big cities, the air lines should use them. A threat to continue the use of old and inadequate facilities, when new and adequate ones become available, is indicative of a readiness to sacrifice safety for profits. It is indicative of policies that will destroy the faith of the public in the integrity of air-line management.

Finally, the air lines should publish and publicize their safety records. The air traveler has the right to authoritative information as to the safety as well as the speed of the transportation he purchases.

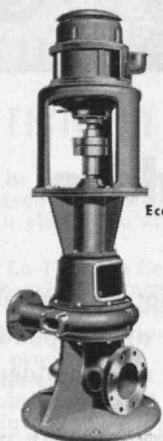
But what about the aircraft industry? What contribution to the increased safety of commercial air transportation may be expected of it?

We need, first of all, to reduce the fire hazard on airplanes. A great deal has been accomplished in this field. The fire detection devices and built-in CO₂ fire extinguishers carried by modern air liners are marvels of ingenuity. But these detection devices and extinguishers are palliatives which reduce a danger without striking at its roots. What is needed is the elimination of gasoline as a fuel on passenger-carrying transport planes. Research and experiment in fields leading to the development of practical oil-burning Diesel

(Concluded on page 240)



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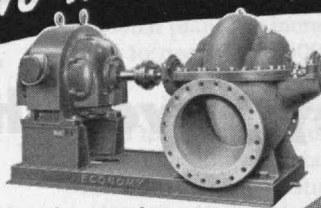
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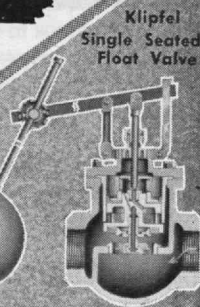
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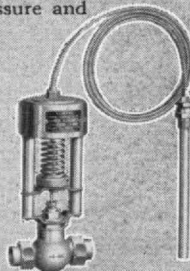
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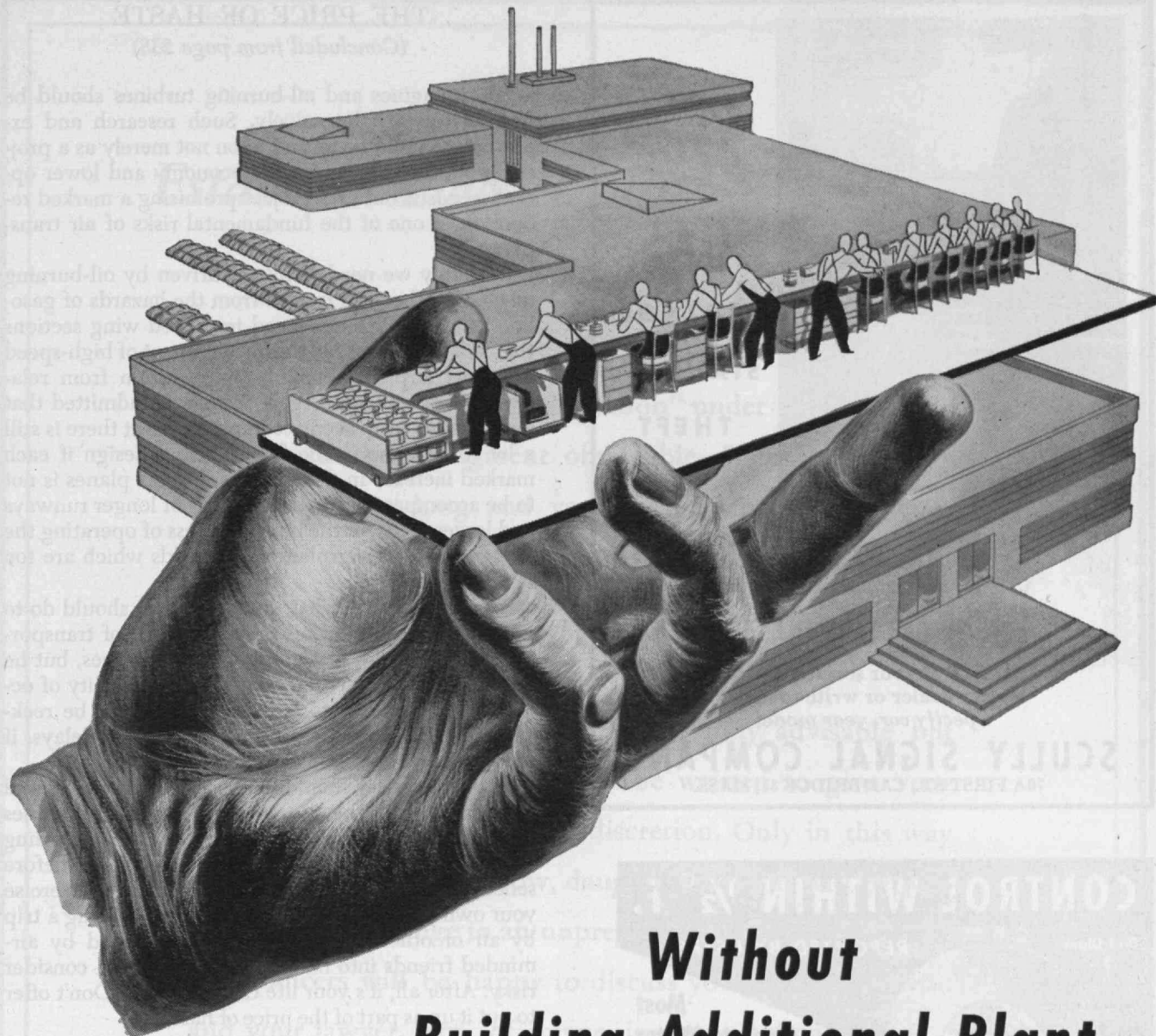
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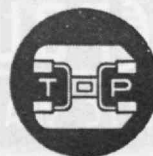
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THE PRICE OF HASTE

(Concluded from page 238)

aviation engines and oil-burning turbines should be pushed forward intensively. Such research and experiment should be looked upon not merely as a project promising improved fuel economy and lower operating costs, but as a project promising a marked reduction in one of the fundamental risks of air transportation.

Certainly we need airplanes driven by oil-burning machinery that will free us from the hazards of gasoline as a fuel. We also need improved wing sections that will make possible the development of high-speed transport airplanes capable of operation from relatively short runways. Again it must be admitted that much has already been accomplished. But there is still a lot to be done in the field of wing design if each marked increase in the size of transport planes is not to be accompanied by the necessity of longer runways and larger fields, or the risky business of operating the newer and larger airplanes from fields which are too small for them.

This brings us to what the air traveler should do to improve the safety of his favorite means of transportation. He should, first of all, use the air lines, but he should use them intelligently. The inevitability of occasional delays due to bad weather should be reckoned with in planning air travel, and such delays, if they occur, should be borne with patience.

The air traveler should watch the performance and safety records of the lines he uses. Patronize the lines that follow conservative policies in matters regarding safety. Patronize the lines that consider safety before schedule. And, last of all, don't be afraid to exercise your own judgment as to the wisdom of making a trip by air or other means. Don't be persuaded by air-minded friends into making flights that you consider risky. After all, it's your life that's at stake. Don't offer to put it up as part of the price of haste.

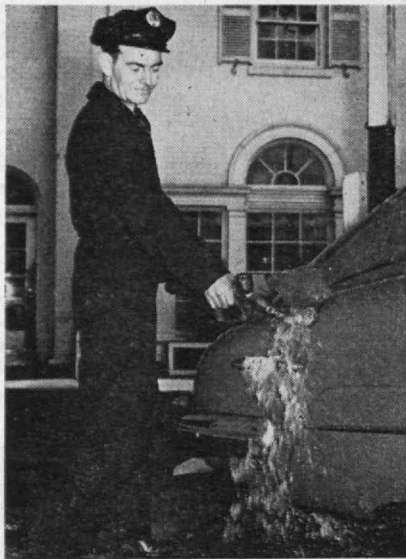
THE TREND OF AFFAIRS

(Concluded from page 214)

pounds can be read in total stresses of as much as 5,000,000 pounds.

A catwalk elevator encircles the machine, and permits the engineers to work at any desired level, setting up their test specimens with the help of an overhead crane. When the actual test begins, observers stand on the elevator behind a safety screen of steel plate and bullet-resisting glass.

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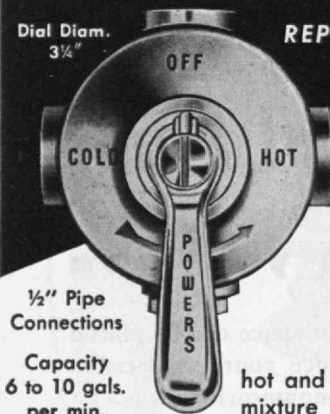
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MAIL RETURNS

(Concluded from page 204)

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Taking Exception

FROM BARNETT F. DODGE, '17:

I was much interested in the article in the December, 1948, Review on André-Marie Ampère. I must, however, take exception to two statements made by the authors. They imply that Lavoisier was the discoverer of oxygen. I believe that it is well agreed by most authorities that Priestley was the discoverer and not Lavoisier.

I should also like to point out that Mt. Blanc is not the highest in Europe by any means. There are several higher mountains in the Caucasus, and Mt. Elbruz is the highest in Europe, being nearly 3,000 feet higher than Mt. Blanc.

New Haven, Conn.

Influence on Economics

FROM WALTER R. INGALLS, '86:

As a B.S. of 1886 and one who listened to General Walker on economics, I was flabbergasted to read on page 52 of your issue for November, 1948, that the teaching of economics at M.I.T. has been greatly influenced by the writings of the late Lord Keynes, which would distress General Walker, if he were alive, as it does his living disciples.

Georgetown, Mass.

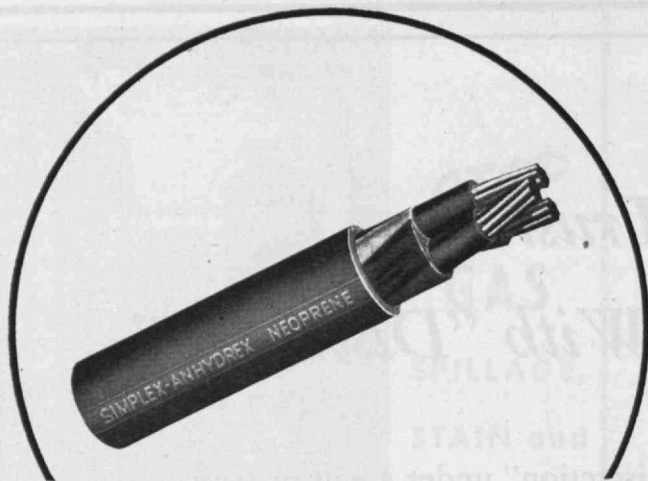
THE CASE AGAINST THE REBEL PAINTERS

(Continued from page 220)

By and large, however, incongruity, not social comment, is the stock in trade of the rebel painters. Said the cubist, Apollinaire:⁸ "You may paint with whatever you please — with pipes, postage stamps, postcards or playing cards, candelabra, pieces of oilcloth, collars, printed newspapers." It may be supposed that where the theme is the juxtaposition of the unrelated, the technique or medium is, of course, an irrelevancy.

Since the heyday of the impressionists, the cult of the artist as ego has reigned supreme. The mind's eye of the painter takes the place of the object; or at least his insight may be said to rival his eyesight. The artist's own aesthetic experience need have no relationship to any perceived reality. For there is a superreality, the interior universe of the artist's own imaged experience. The dethronement of the objective world means the establishment of the illusions of nonobjective art, which, according to the German expressionist, Kandinsky,⁹ "is destined to fling open the door into a world of mysteries vaster than those known to science or mechanics."

The scientist, the mechanic, the technologist are a villainous trinity for the rebel painters, who have been literally fascinated for two generations now by the



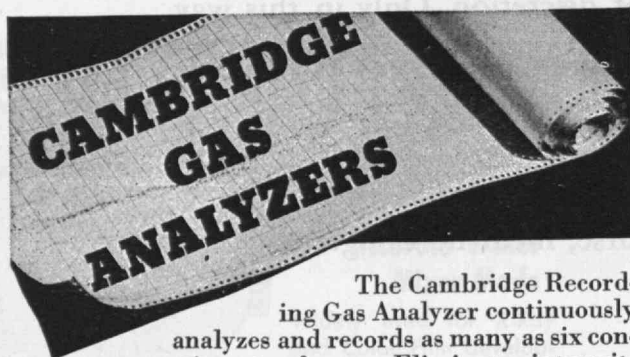
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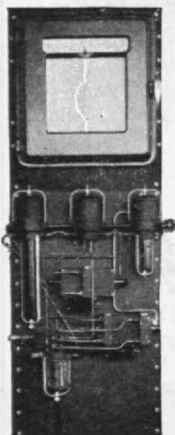
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cultic search for the esoteric, mysterious, mystic. Probably nothing has given them more inspiration than the museum collections of primitive art. They are deeply indebted to the primitive for leading them to the arcana of a new-old art — magic. Said Kandinsky:¹⁰ "Art is looking for help from the primitives." To which Chirico¹¹ adds: "Perhaps the most amazing sensation passed on to us by prehistoric man is that of presentment. We might consider it as an eternal proof of the irrationality of the world." An aesthetic protest against a technological civilization, this obsession with the irrational — Salvador Dali,¹² for instance, revels in it for scores of pages in his *Secret Life* — appears to spread throughout the range of modern painting.

Few modern painters have exemplified this mania for the irrational better than the Dadaists and the surrealists. Warned a surrealist manifesto¹³ of many years ago (the rebel painters are fond of the word "manifesto"): "You have no idea how far our hatred of logic can take us." Since that time, observers of modern painting have seen that these words were not mere gesture. Visitors to the Museum of Modern Art, where the rebel painters have found a more agreeable shrine — after their first showing in the old Armory — have had the benefit of many a corroborative interpretation by the Museum officials. Of Marc Chagall,¹⁴ the Museum catalogue calls attention to his "love for the incredible and bewitched." About Chirico,¹⁵ there is the illuminating information that his paintings "were saturated with the sense of the mysterious and the occult."

Passion for Irrationality

The passion for the irrational has sent the rebel painter off into the fantastic and the subconscious. Iconographer of the intelligent and the intelligible, he has roamed with relish in the realm of psychic automatism, chance, double imagery, dream symbolism, hallucinations, and metaphysical experiences. His journey into the dark has been made, despite his loudly proclaimed antirational motives, with a carefully stated rationale. Thus, surrealist André Breton¹⁶ has written: "The 'fantastic' . . . constitutes in our view the supreme means of fathoming the secret depths of history which disappear beneath the maze of events. It is only at the approach of the fantastic, at a point where human reason loses its control, that the most profound emotion of the individual has the fullest opportunity to express itself . . ." The objectless world of fantasy, the dimly remembered imagery of childhood, the brute *vital* of the primitive, the juxtaposed pattern of unrelated items, these seem to preoccupy the rebel painter. And the visible or measured world of rational science or the empirical life of the modern man seems to be only the butt of his vehemence. In his hand plastic form and linear rhythm have neither focus nor eye ease. The aim seems to be to shock and confuse.

Rebel artists, says Robsjohn-Gibbings¹⁷ in his justly acclaimed study, have drawn a mustache across the face of Mona Lisa. Their paintings and their words

(Concluded on page 244)



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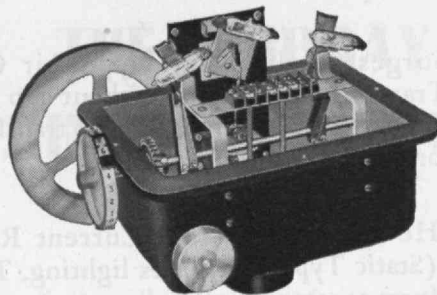
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THE CASE AGAINST THE REBEL PAINTERS

(Concluded from page 243)

both seem to substantiate his thesis. But why? There seems to be no easy answer.

Robsjohn-Gibbings seems to think there has been a conspiracy among the painters. "Modern art," he exclaims,¹⁸ "is not modern at all. It is a revival of one of the oldest systems for getting power. It is a revival of magic."

More sympathetic and perhaps more convincing, English critic, Herbert Read,¹⁹ feels that "there are conditions in modern life which give rise to a similar spiritual attitude in men, and to a similar expression of that attitude in art." He adds: "The modern artist, feeling himself no longer in any vital contact with security, performing no necessary or positive function in the life of the community, retreats upon himself, and gives expression to his own states of subjectivity, limiting himself to this expression." The dissociation so characteristic of rebel painting is traceable to the dissociation of the rebel painter from industrial civilization, and, as a result, from sensibility.

Whatever the explanation, in much of modern painting we find ambiguity in place of clarity, hallucinations instead of perceptions, subjective involution rather than objective orientation, experimentation in technique (for example, cubes, cones, and planes of the cubists), not experimentation in contexts.

The rebel artist has been painting a private mythology for a civilization which is in desperate want of a master myth.

References

- ¹ New York: Charles Scribner's Sons, 1931. \$2.50.
- ² Janis, Sidney, *Abstract and Surrealist Art in America*, page 23 (New York: Reynal and Hitchcock, Inc., 1944), \$6.50.
- ³ Janis, *opus cited*, page 101.
- ⁴ Janis, *opus cited*, page 102.
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- ¹⁴ Robsjohn-Gibbings, *opus cited*, page 241.
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- ¹⁶ Breton, André, "Surrealism, Yesterday, Today, and Tomorrow," *This Quarter*, September, 1932, page 7 ff.
- ¹⁷ Robsjohn-Gibbings, *opus cited*.
- ¹⁸ Robsjohn-Gibbings, *opus cited*, page 13.
- ¹⁹ Read, Herbert, *Art Now*, pages 115, 117 (New York: Harcourt, Brace and Company, 1934), \$3.75.



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SOIL CONSERVATION

(Continued from page 224)

or soils projects or extension projects, but a combination of these, with other specialized activities where needed, operated conjointly with such reorganization of farm procedure as the character of the land indicates as being necessary. The procedure is based on the best information in the possession of scientific agriculturists: — the agronomist, forester, range specialist, agricultural engineer, economist, extension specialist, game specialist, geographer, and others. It is the application of accumulated knowledge pertaining to the great multiplicity of variables affecting the three-phase process of absorption, runoff, and erosion, employed not as single uncoordinated implements of attack, but collectively, according to the needs and adaptability of the land, in a combination of integrated control measures, to be supplemented where necessary by new information accruing from the experience of combat.

This co-ordinated effort is perhaps the most vital element in the whole approach to erosion control. It represents a synthesis of the application of scientific knowledge and method.

The Conservation Farm Plan

Given a fundamental knowledge of soil erosion, a reasonable classification of land according to its capability for use, and the integration of numerous sciences pertinent to a broad program of erosion control, there still remains the problem of blueprinting specifications for the actual application of the job to be done. Conservation is not accomplished until it takes shape on the land. The land owner, or operator, must know and understand what needs to be done. To facilitate this, a conservation plan is written for each farm or ranch or other operating unit of land.

The plan consists of a map showing the land capability classes for the farm, delineated on an aerial photograph. Along with this map, or superimposed upon it, is a map of the most appropriate use of the land in accordance with its capabilities. Often, one of the first things that needs to be done to achieve conservation on the land, is to change the type of use. It is highly desirable that land now used for crops, but not suited for permanent cultivation, should be converted to grass or woodland. In some instances, land now in woodland or pasture can be safely cultivated. In order to bring use into conformance with inherent capabilities of the land, such land-use conversions are of paramount importance.

For each use, appropriate conservation practices are needed. For various classes of cropland, some of the practices recommended may be contour cultivation, strip cropping, terracing, crop residue management, and cover crops. On grazing land appropriate soil conservation practices are proper stocking, seeding, fertilizing, mowing, and stock-water development. In woodlands there may be tree planting, prevention of fire, and exclusion of grazing. On wild-life lands, such as marshes, there may be level ditching to improve the marshes for muskrat or waterfowl or other wild-life production.

Specifications for proper land use may often require considerable readjustment of the farm economy. Be-

cause of economic limitations of the farm operator, it is not always possible to follow exactly the recommended soil-and water-conservation practices called for by the land conditions. The guiding principle, however, is to bring the use of the land and the required conservation practices as close as possible to meeting the requirements set up by the conditions of the land. Thus, under some conditions, some land may be used more intensively than it should be. On land so used, erosion is very likely to be severe. On the other hand, land need not be used as intensively as it can be. Although much of New England is Class II and Class III land, capable of cultivation under limited restrictions of use, it is most profitably maintained in pasture and forest. Tilled crops from these lands can no longer compete with similar products from even richer croplands like those of the Middle West.

Summary

In the United States more than a half million farmers and ranchers have begun to remake their farms and ranches in accordance with individually designed soil- and water-conservation plans based on land capability surveys. This is only a fraction of the 6,000,000 farmers and ranchers in the United States, but it is a significant number, considering the newness of the subject, the readjustments sometimes required, and the complexity of the problems often encountered. In every case, the land operator, on the farm

or ranch, is receiving the professional assistance of a soil conservationist who is trained to bring to the solution of the land problems the pertinent aspects of appropriate sciences that contribute to their solution.

In summary, let us review the points already covered. Soil is a complex, variable natural substance. Under conditions of use by man, soil erosion and soil depletion often proceed at a remarkably fast rate. Accelerated erosion has destroyed or greatly reduced the productive usefulness of large areas of land throughout the world. In the United States, public interest in erosion control has grown into a national program within the past two decades. This interest was first manifest by research on erosion, followed by passage of the Soil Conservation Act of 1935 and subsequent development of local action groups — soil conservation districts — in all 48 states, Hawaii, Alaska, and Puerto Rico. Fundamental to the carrying out of soil conservation work by land owners and operators is the land capability classification, which designates the limits of safe use. Based on the capability survey, appropriate soil- and water-conservation practices are recommended by soil conservationists who utilize appropriate information from a broad array of various sciences. On individual farms and ranches, land operators put into practice the land-use conversion and the soil- and water-conservation practices required to make the most productive use of the land over an indefinite period of time without deterioration of the soil resource.

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(Continued from page 226)

After everything that has gone before, the statement that every even number can be represented as the sum of two primes sounds as if it were one of Fermat's marginal scribblings, especially if one learns that there is no proof. Actually it was proposed in 1742 by the mathematician, Goldbach, and is therefore known as Goldbach's theorem or, more correctly, as Goldbach's conjecture. Goldbach himself did not claim to have a proof. Goldbach's conjecture merely worked, as the following few examples indicate:

$$84 = 37 + 47$$

One thing, that anybody who is interested in them will do first, is to count them. The result is that there are:

50,847,478 primes in the interval from 1 to 1,000,000,000

Naturally, the interval from one prime to the next increases as the figures grow. The largest known interval is between 4,652,353 and 4,652,507. But so far no law of any kind has been found to give the number of primes which may be expected in a given interval, except for an equation giving an approximate value. If n is the number of primes in the interval between 1 and the integer N , the number of primes is given (approximately) by the equation:

$$n = N / \log_{\varepsilon} N$$

This equation indicates the presence of 22 primes in the first hundred (actually 26); 145 primes in the first thousand (actually 168); 72,382 primes in the first million (actually 78,498); and 48,254,942 in the first billion where there are actually almost 51,000,000 primes.

Public Opinion

That the public, probably as an aftermath of the much publicized Wolfskehl Prize, is still convinced that (A) mathematicians aren't so very bright, and that (B) there are tangible rewards for mathematical discoveries was experienced by the German mathematician Theodor Wolff in the late 1920's. Dr. Wolff wrote

(Concluded on page 250)



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TAKE A NUMBER

(Concluded from page 248)

popular articles on mathematical problems in a German weekly magazine and one of these articles also dealt with primes. He stated that the largest prime then known was $2^{127} - 1$, and that proof had been obtained that the number was a prime. He explained what the expression $2^{127} - 1$ meant and added that its numerical value was unknown. But he added jokingly that there might be a *Dr. math honoris causa* for calculating it, and thereby Dr. Wolff invited trouble.

To his surprise (and horror) his readers took him seriously. Not realizing that the important (and difficult) job was to prove this figure a prime, they sat down and started calculating the numerical value, flooding the unfortunate author with letters, parcels, and wires, often cautiously stating only the beginning or the end of the figure and all asking where they had to apply for the honorary degree in mathematics.

Wolff's first job was to sit down and to calculate the numerical value of $2^{127} - 1$ himself. His second job was to reply to all the correspondence that had descended upon his desk, and also to get rid of a few people who called in person. In the end he presumably got out of the trouble he had caused himself. But the result of all this excitement about a nonexistent prize, in this case an honorary degree, was that the numerical value of $2^{127} - 1$ was calculated. It is:

170,141,183,460,469,231,731,687,303,715,884,105,727.

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Gamow, George, *One, Two, Three . . . Infinity* (New York: The Viking Press, 1947), \$4.75.

Wolff, Th., *Der Wettlauf mit der Schildkröte* (Berlin, Germany: A. Scherl, 1929).

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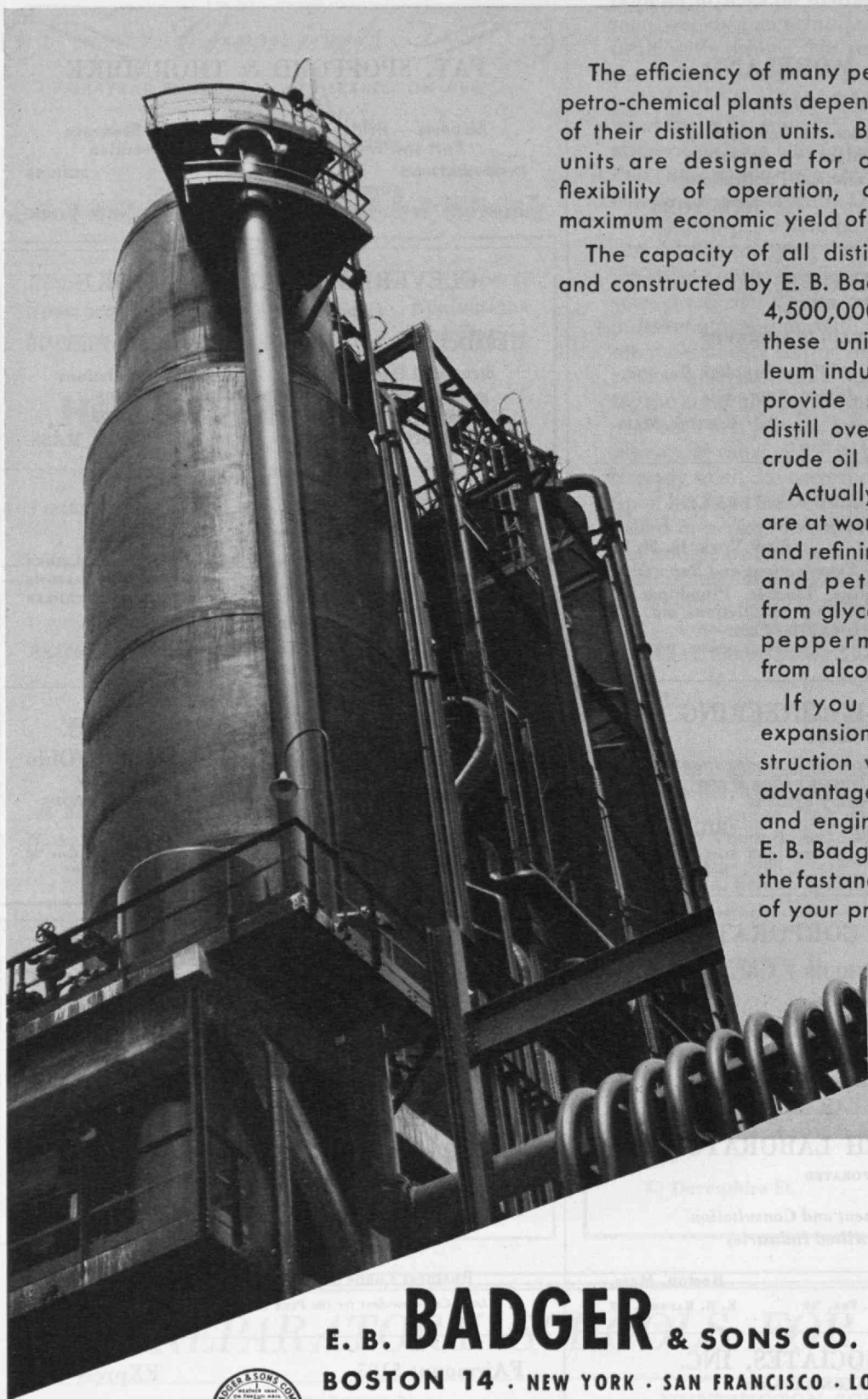
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This editorial, written nearly 30 years ago, has had its counterpart in almost every first fall issue of *The Tech*, before and since. "Your opportunities are numbered by the stars. . . ." Hackneyed but true. Opportunities are what we make of them. How many of us recognize those opportunities when they arise? How many of us capitalize on them?

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The Faculty and Administration are directly in charge of the Institute and its operation. However, no educational institution can long remain in pre-eminent position without the loyal and wholehearted support of its alumni. This the Institute has always had. It is evident in many ways, and not the least of these is its direct support by some 10,000 Alumni through the Alumni Fund. You, as a participant in this Fund, are helping M.I.T. to realize some of its opportunities. The author of that early editorial can, indeed, recognize that here are "good Tech men with all the responsibilities which that name implies."

Alumni AND Officers IN THE News

Active Authors

- LESTER D. GARDNER'98, "The World the Kitty Hawk Made." Published in *Colliers'* December 25, 1948, issue.
- EARLE B. PHELPS'99, *Public Health Engineering*, Volume I. Devoted to two of the three chief environmental factors which affect public health; namely, air and water. Published by John Wiley and Sons, Inc., 1948.
- JOHN T. NORTON'18, "A Technique for Quantitative Determination of Texture of Sheet Metals. Published in the December, 1948, issue of the *Journal of Applied Physics*.
- WALTER C. SADLER'21, *The Specifications and Law on Engineering Works*. Published by John Wiley and Sons, Inc., 1948.
- JOSEPH H. KEENAN'22 and Joseph Kaye '34, *Gas Tables*. Published by John Wiley and Sons, Inc., 1948.
- HERBERT H. UHLIG'32, *Corrosion Handbook*. Published by John Wiley and Sons, Inc., 1948.
- HARRY C. KELLY'36, "A Survey of Japanese Science." Published in *The Scientific Monthly* of January, 1949.
- SANBORN C. BROWN'44 and John J. McCarthy, "A Microwave Gas Discharge Counter for the Detection of Ionizing Radiation." Published in the December, 1948, issue of *The Review of Scientific Instruments*.
- GEORGE R. HARRISON, JOHN R. LOOFBOUROW, RICHARD C. LORD, JR.; three Staff members who collaborated to produce, *Practical Spectroscopy* which has been published by Prentice-Hall, Inc., 1948.
- NORBERT WIENER, Staff, *Cybernetics*. Control and communication in the animal and the machine. Published by John Wiley and Sons, Inc., 1948.

High Honors

- WARREN K. LEWIS'05, Professor Emeritus of Chemical Engineering, has been selected to receive the 1949 Gold Medal of the American Institute of Chemists in recognition of his administrative ability, leadership and outstanding success as a teacher. The medal will be presented to Dr. Lewis at the annual meeting of the American Institute of Chemists in Chicago on May 6 and 7, 1949.
- JAMES R. KILLIAN, JR., '26 received the honorary degree of doctor of engineering from the Drexel Institute of Technology on December 14, 1948.
- GEORGE R. HARRISON, Staff, was awarded the Medal for Merit on December 31, 1948. The medal, highest honor that can be bestowed on a civilian in recognition of outstanding service to the nation, was presented to Dean Harrison by Karl

T. Compton, chairman of the M.I.T. Corporation.

- PAUL PIGORS, Staff, won the 1948 Lieutenant Ben Toland Memorial Fellowship Award with his book-length manuscript, "Effective Communication in Industry." This award was established by the National Association of Manufacturers.

Industrial Interest

- EVERETT S. COLDWELL'15 was elected president of Ford, Bacon and Davis, Inc., on January 1, 1949.
- JOSEPH S. SCHERER, JR., '23 is now the president and general manager of Reo Motors, Inc.
- HAYDEN B. KLINE'24 took over the duties of president and chief executive officer of Industrial Rayon Corporation on January 1, 1949.
- GEORGE P. EDMONDS'26 has been elected a member of the board of directors of the Continental Can Company. Mr. Edmonds is president of the Wilmington Trust Company, Wilmington, Del.

Wise Words

- HARDY CROSS'08, head of the department of civil engineering at Yale University, spoke on "The Faith of an Engineer" at a meeting of the northeastern section of the American Society of Civil Engineers on December 7, 1948.
- WILLIAM G. RAFF'22 selected "Erection of Steel Structures" as the subject which he presented before a meeting of the Lehigh Valley section of the American Society of Civil Engineers on November 9, 1948.
- JAMES R. KILLIAN, JR., '26 was in Washington, D.C., on November 9, 1948, to discuss "Industrial Research in Engineering Colleges: Its Benefits and Hazards" at a meeting of the research section, engineering division, Association of Land-Grant Colleges and Universities.
- EDWARD S. THOMPSON'28 spoke before a meeting of the Boston section of the American Institute of Electrical Engineers held at the Institute on December 14, 1948.
- SEYMOUR E. HEYMANN'39 addressed a meeting of the American Society of Mechanical Engineers on December 2. His subject was, "Selecting Aircraft Heating Equipment."
- JOHN H. HOLLOMON'40 spoke on "Deformation of Metals" before the Connecticut section of the American Institute of Mining and Metallurgical Engineers at a meeting held on December 14, 1948.
- ERIC G. NEWBERG, JR., '46 was the speaker at the educational meeting, Chicago section, of the American Society for Quality Control on December 15, 1948. Mr. Newberg's subject was, "Fundamentals of Acceptance Sampling."

Obituary

- HENRY SAVAGE'83, November 13.
- DANIEL L. COBURN'84, November 3.
- FRED A. WHITNEY'86, March 15.*
- CHARLES H. PUTNAM'88, in November, 1948.
- RALPH W. REYNOLDS'88, June 9, 1947.
- CONSTANTINE D. TUTTEIN'89, October 21.
- CHARLES H. HANINGTON'91, September 10.
- HENRY C. DRESSER'92, October 31.
- EDWARD C. HALL'92, in November, 1948.
- MARVINE GORHAM'93, December 21.
- EDWARD B. READ'93, in November, 1948.
- JAMES H. REED'93, February 13, 1948.
- ALBERT B. TENNEY'94, December 5.*
- RICHARD MOREY'95, January 20, 1948.*
- ALBERT E. CLUETT'96, January 3, 1949.*
- CHARLES W. TUCKER'96, December 8.*
- KLAUS J. STEINER'97, October 4.
- ALPHEUS A. PACKARD'98, August 7.*
- CHARLES F. WING, JR., '98, September 28.*
- CLIFFORD M. BALKAM'99, May 14.*
- AMOS A. LAWRENCE'99, November 14.
- JOSEPH E. LEWIS'99, December 7.
- JOHN MAGEE'99, February 8, 1948.
- DAVID C. MILLS'99, November 1.
- JAMES L. LITTLE'00, December 16.*
- HENRY B. BARRY'02, June 25, 1947.
- FRANK H. MASON'02, December 17.
- WILLIAM E. STANHOPE'03, December 5.
- EDWIN F. ALLBRIGHT'04, November 12.*
- JOHN H. DRAPER'04, December 18.*
- ALBERT M. READ'04, in November, 1948.
- GEORGE H. SHAW'04, November 7.
- EDWIN P. TRIPP'04, October 31.*
- CARL H. GRAESSER'05, December 18.*
- WILLIAM E. KERSHAW'07, October 29.
- GEORGE E. DALRYMPLE'08, October 9.
- MANUEL A. CADENAS'10, August 12.
- WALTER H. HILDEBRAND'11, November 8.*
- BERTRAM S. FENNER'12, in 1946.*
- ALBERT L. PASHEK'12, October 26.*
- JOSEPH A. TENNANT'13, December 14.
- EDWIN C. LUCE, JR., '14, December 11.
- KEBE TOABE'15, December 7.*
- WALTER HAYNES'16, October 5.
- FRANK S. HUNT'16, November 20.*
- NICHOLAS V. S. MUMFORD'16, July 17.
- RAYMOND F. GOUDEY'17, December 16.
- GEORGE M. LOVEJOY, JR., '17, November 17.
- STEPHEN M. FOSTER'18, November 3.
- GEORGE P. GAIL'19, May 1.
- JOHN L. KARMIRE'19, in December, 1943.*
- RAY POWERS'19, September 7.
- CARLTON G. NORTON'29, November 19.* (Appears in 1927 notes.)
- H. CLARE HORWOOD'34, October 30.
- PETER WHITE'36, December 12.
- R. MAYO FOSTER'38, October 11.
- ALVIN C. SCHOLF'39, October 1.
- JAMES G. MAGEE'40, in December, 1948.

*Mentioned in class notes

News FROM THE Clubs AND Classes

CLUB NOTES

M.I.T. Club of Chicago

The members' night meeting of the Club was held at the Electric Club on December 2. After a fine dinner, President Herb Kochs'24 introduced the event chairman, Past President Pete Lavedan'20. Pete, with his usual finesse, introduced Penn Brooks'17, Vice-president of Sears Roebuck and Company, who gave a down-to-earth story on "The Science of Merchandising from the Engineering Approach." Those of you who missed this talk by Penn Brooks certainly missed a treat. — Pete Lavedan then introduced George Dandrow'22, President of the Alumni Association and our guest of honor. George gave us a résumé of alumni news and went into a little more detail on Dr. Compton's new duties. He also discussed the admissions program and the current drive for some 20 million dollars for the Institute's expansion program. George's talk was loaded with stories, told as only he can tell them. At the conclusion of his talk, Pete Lavedan presented him with a beautiful plaque, making George an honorary member of the Chicago Club.

Honors for the man of the month go to our foreign visitor from Iran, R. Zargarpur '46 now in the Hotpoint Engineering Department, heating unit division, who has been in the United States for five years and is planning on becoming a permanent resident here. We hope to see him at more of our meetings. — President Kochs announced that Professor William L. Campbell'15 will be the speaker for the February meeting, and Dick Mason'31 will be dinner chairman.

A junior Club meeting occurred bright and early on the morning of November 30 when three of our club members enjoyed the privilege and pleasure of joining John Barriger's[21] party celebrating the opening of the Monon's new Cedar Lake cut-off. This new section of track will permit the Monon's diesels to save time on their runs to and from Chicago and is one more of John's accomplishments on this very progressive railroad. Present on the special section of the Monon's "Tippecanoe" for this event was the lovely Mrs. Elizabeth Barriger, sons John, Jr., M.I.T. '49, and Stanley, a Winnetka High School sophomore, Sherry O'Brien'17, Wendell Allen '33 of the Pennsylvania Railroad, John G. Praetz'28 and a host of railroad executives, investment brokers and friends of the Monon. It was a most enjoyable event with breakfast aboard and a trainload of grand fellows. Congratulations to our club Vice-president John Barriger'21, President of the Monon, the only railroad presidented

by an M.I.T. alumnus. Incidentally, could there be any significance in the fact that the Monon's trains are painted cardinal and grey, and that these are Technology's colors?

Your Secretary received a very interesting letter from Lon Green'87 just before he left on his annual trip to the land of cocoa-nuts and palms which told about the big affair back in 1915 when our Club was host to the M.I.T. Clubs of America. Lon tells us a special train took the entire party to Gary; the train was donated by Theo Robinson'84. Louis Ferguson'88 donated several cases of champagne after the banquet at the end of three days of festivities. These old-timers surely went to town. — We hope that this coming year will see more and more of you attending our meetings and enjoying the good fellowship that prevails at these gatherings. — JOHN G. PRAETZ'28, Secretary, The Liquid Carbonic Corporation, 3100 South Kedzie Avenue, Chicago 23, Ill.

M.I.T. Club of East Tennessee

Our Club, which meets only when special occasions arise, has found two such occasions within a single month. On November 8 Paul M. Chalmers, Assistant Director of Admissions at the Institute, was in Knoxville. Twelve of our members were present for a very enjoyable luncheon engagement with Mr. Chalmers at the Andrew Johnson Hotel and he was able to tell us of some of the recent activities at the Institute and described in considerable detail the program for foreign students which had been initiated by members of the student body for the summer of 1948.

On December 3, the Club met again for an evening meeting to which wives and guests were invited. Special guests of the evening were the staff and students of the first class of the Engineering Practice School which has been established by M.I.T. at Oak Ridge. William A. Reed'43, Director of the Practice School, was speaker of the evening and described first the Chemical Engineering Practice School and the way it operates in New England plants and then discussed the development of the new Practice School at Oak Ridge. Dr. Reed's talk was thoroughly enjoyed by all present. He was accompanied by his assistant, Raymond F. Baddour, and student group, Messrs. Cantwell, Conway, Johnson, Kirkham, Sandock, Sheehan, Spiewak, and Stirling. President Hickman '36 had appointed a nominating committee to arrange for a new slate of officers for the Club. Albert G. Kern, Jr., '34 was elected president; Robert B. George'23 and Howard P. Emerson'28, vice-presidents; Richard E. Hickman'36, executive committee; Dana M. Wood'06 and George P. Palo'28 were re-elected treasurer and secretary, respectively. — GEORGE P. PALO '28, Secretary, Tennessee Valley Authority, 202 Union Building, Knoxville, Tenn.

Indiana Association of the M.I.T.

On December 2, the active members, with their wives as guests, dined in the banquet room of the Apex Grill in Indianapolis for the annual holiday-season meeting. Decorations in the Yuletide spirit lent an informal atmosphere and dinner was enjoyed in cheerful fellowship. Kenneth Smith, chief ceramics engineer of the American Art Clay Company, discussed modern ceramic arts, crafts and manufacturing from both the hobby and industrial point of view. The speaker and his subject proved especially interesting to our lady guests who have suggested more mixed meetings be held during the year. — HARRY C. KARCHER'25, Secretary, 320 West 43d Street, Indianapolis 8, Ind.

M.I.T. Association of Japan

E. Charlton Crocker'43, Alumni Council representative of the Association, received a letter from Masaru Kametani'26, Vice-president of the Association, from which the following has been sent for inclusion in these notes: "I was very much surprised to learn upon my return to Tokyo that Professor Locke'96 had died. As a matter of fact, I did not even know that he was ill. He was certainly too good a man to lose and has been a good friend to many Japanese. In fact, I am very proud that I was one of his many Japanese friends. . . . There is one reason why I have written so seldom to you; that is, we have been unable to hold a meeting since last June. As you know, our living conditions are not so good as to afford even a luncheon meeting because our food situation is still very poor. Another reason is that Mr. Hettich'43 has returned to America and Lieutenant Colonel Weinberg'28 has been transferred to Kobe, and they were the center of our encouragement in many ways. However, by the end of the year, we are certainly going to have a meeting. . . .

"I have not seen Mr. Yamashiro'42 for many months, but I believe that he is well and working hard. About the four cases of periodicals which you sent; it is my understanding that Mr. Yamashiro has taken care of these for the time being until we can have a definite place to keep them so that our members can be invited to use them at any time. I was informed that there will be additional members in Tokyo both among the occupation forces and the Japanese. Your kind letter has been introduced to several of our club members and the Japanese Mining Society is planning to extract a part of your letter for their journal announcing the death of Professor Locke'96. . . ." — JOHN K. MINAMI'31, Secretary, Edogawa Apt. Shinogawamachi, Ushigome, Yodobashi-ku, Tokyo, Japan. GEORGE YAMASHIRO'42, Associate Secretary, ESS/ST-GHQ-SCAP, A.P.O. 500, San Francisco, Calif.

Niagara Falls M.I.T. Club

A Christmas party was held on December 10 at Lewiston, N.Y., for the hale and hearty members of the Club at which a short business meeting was held. The new officers elected were Larry Cavendish'38 as president and Ed Kane'47 as secretary-treasurer. After a delicious meal had been served, an interesting film on the uses of atomic energy was shown through the courtesy of Bill Hope'36. The party was attended by a group varying from the Class of 1897 to the Class of 1948. Those in attendance were: Arnold Arch'40, Larry Cavendish'38, Jack Conroy'44, M. B. Geiger'28, Earl Hauman'16, Art Hinckley'08, Bill Hope'36, Ethan Howard'97, Ed Howard'38, Ed Kane'47, R. MacMullin'19, R. A. Montgomery'19, John Neal'15, C. N. Richardson'16, Carl Rohrer'48, G. C. Sweeney, Jr.'47, Jim Woodburn'46.

A unanimous vote of congratulations was voted to Harry L. Noyes'90 who recently celebrated his 50th anniversary. Mr. Noyes, incidentally, is the senior member of our group and is well loved by all. — EDWARD D. KANE'47, *Secretary*, 403 Jefferson Avenue, Niagara Falls, N.Y.

M.I.T. Club of Rhode Island

The Club opened its 1948-1949 season with the annual dinner at the ToKalon Club in Pawtucket on December 3, 1948. Frank Dunn'39, our President, paid tribute to Charles F. Tillinghast'95, whose death occurred on October 3. Mr. Dunn read a letter written by Mrs. Tillinghast in which she recalled his great and long interest in the affairs of M.I.T. and the Club. Mr. Tillinghast was a most active member and his passing is noted with sincere regret.

We were most fortunate in having Charles "Rip" Engle, Brown football coach, as our guest for the evening. After dinner, Mr. Engle spoke on certain football topics of current interest and followed the talk with a motion picture and commentary on the Brown-Colgate game of the past season. Since many of our members are avid Brown football fans, the evening proved to be most entertaining.

The following Alumni and their guests attended: Russell W. Ambach'24, William H. Barker'32, Charles C. Bell'33, Paul G. Blampied'25, Eugene J. Brady, Jr.'42, Bertram M. Brown'41, J. Burleigh Cheney'11, Theron S. Curtis'16, Frank J. Dunn, Jr.'39, Morris H. Etstein'32, William E. Gould, Jr.'28, Sidney F. Greenwald'43, J. Merrill Hanley'18, Arthur E. Hirst'13, Glen D. Jackson, Jr.'27, Daniel J. Kiely, Jr.'47, Henry E. Kiley'33, Thorwald Larson'28, G. Fred Lincoln'35, J. Warren Lovell'13, Edwin E. Nelson'02, A. J. Puschin'28, Donald G. Robbins'07, J. Douglas Robertson'16, Arthur C. Rowley'38, Walter M. Saunders, Jr.'22, Leonard Shapiro'34, Clinton H. Springer'45, Lloyd H. Turoff'47, Arthur N. Verrier'46, John S. Visscher'20, John B. Waller'41, Ralph W. Wood'21.

Any alumnus who is not listed as a club member but who would like to attend the M.I.T.-Brown dinner at the Rhode Island Country Club in early February should contact the Secretary at the address below. — EUGENE J. BRADY, JR.'42, *Secretary*, 114 Columbia Avenue, Edgewood 5, R.I.

M.I.T. Club of St. Louis

The annual meeting of the Club was held on November 30 at the University Club of St. Louis. Ellis Littmann'33 announced that the new roster will be out the first of the year. All names are being very carefully checked for correct addresses and telephone numbers. Delos G. Haynes'09 gave a report on the Institute's Committee on Financing Development of which he is one of the St. Louis members. A new by-law was voted upon and passed concerning suggested dues of \$1.00 per year for Club members who have not been out of the Institute for ten years and \$2.00 for all other members. It still remains in the by-laws that there will be no solicitation at meetings.

New officers were elected as follows (*marks previously elected officers): President: Edward A. Fulton'30; Vice-president: Eugene S. Weil'21; Secretary-Treasurer: James R. Casserly'43; *Retiring President: Robert J. Joyce'28; Board of Governors *through 1949: Ottway W. Rash, 3d'32 and Ellis C. Littmann'33; *through 1950: Harold E. Thayer'34 and William F. Hecker'42; through 1951: Joseph Desloge'12 and Laurence P. Russe'41. Joseph Desloge'12 then entertained the members present with very interesting movies which showed scenes of his trip down the Colorado River in the Grand Canyon. — JAMES R. CASSELY'43 *Secretary*, Bemis Bag Company, 111 North Fourth Street, St. Louis 2, Mo.

M.I.T. Club of Schenectady

The formation of the Club's civic project committee has crystallized real interest in civic affairs among the members. This committee, composed of B. C. Thorn'41 as chairman, P. L. Alger'15, D. C. Jackson, 3d'40, W. B. Rodeman'44, and R. W. Stanhouse'41, will aim for the following objectives: (1) Obtain the facts on the new Schenectady High School problem and present the facts to the Club and the community. (2) Decide on a plan of action and actively promote it to the community. (3) Enlist the aid and co-operation of other alumni groups. (4) Present a report to the city planning commission in the spring of 1949. It is felt that finding out how the city operates and helping the city council reach a sound decision on this important problem will prove to be a most interesting and worthwhile project, especially in view of the fact that 80 per cent of the club membership of 150 are residents of this city.

At a recent public hearing, Bill Rodeman presented the Club's position before the city council as follows: (1) the Club approves of the city manager's action in including an item of \$35,000 in the proposed city budget for the purchase of land for a new high school and recommends that that sum be approved; and (2) the Club further recommends that a \$25,000 initial architect's fee be approved for the budget so that work may be started on soil tests and building and plot layout. Once the general layout of the land has been made, it will be possible to complete the much needed playground and athletic field before the high school building is completed. Bill's presentation made it clear

that the Club intends to follow the high school plan closely and do what it can to further the project. — IVOR W. COLLINS'41, *Secretary*, General Electric Company, Building 56-201, Schenectady 5, N.Y.

M.I.T. Club of Southern California

A Ladies' Night featured the fall meeting of the Club on November 8, at Lockheed Air Terminal Sky Room Café. Arrangements were made for members and guests to see and examine a Lockheed Shooting Star F80T jet airplane before the dinner. A photograph was taken of the group around the plane. Following the dinner, Hall Hibbard'28, Vice-president and chief engineer of Lockheed Aircraft Corporation, introduced the speaker, Willis Hawkins, who has for many years been chief preliminary design engineer for the Lockheed company and who has designed practically all of the Lockheed airplanes. Mr. Hawkins, a graduate of the University of Michigan, gave a very interesting explanation of present trends in airplane design which he said is truly a specialist's paradise. Members who had paid their local club dues were sent membership cards with the meeting notice and those who remitted for their dues with their reservation slips were presented with membership cards at the meeting. Treasurer George M. Cunningham'27 reported that the club's treasury was "flush" and that a revision of the 1946 local membership directory was soon to be under way. Bob Alder'37 heads the directory committee this year. Chairman Phil K. Bates'24, who returned recently from Boston, told of the administrative change at the Institute. More than a hundred members, wives, and friends were present as follows: H. M. Morley'03, Harold Sharp'09 and wife; Hiram E. Beebe'10 and wife; William C. Lynch'12 and wife; Page Golsan'12 and wife; Francis B. Morton'13, Eulalice E. Morton, Agnes Morton O'Connor, Mary Morton Kelley; Merrill J. Smith'13; Kenneth D. Kahn'15 and wife; William Mellem'15 and wife; Walter B. Rivers'15 and wife; Raymond B. Stringfield'15 and wife; Robert Welles'15 and wife; Robert W. Kallejian'16; Bernard S. Coleman'19 and wife; G. Harold Hopkins'20; Jackson W. Kendall'21, wife and son; Foster M. Post'21 and wife; John W. Hemphill'22 and wife; John P. Livadary'22, wife, daughter, and son; Philip K. Bates'24 and wife; Rockwell Hereford'24 and son; Thomas J. N. Taylor'24; Edward W. Carlton'25; S. G. Eskin'26; Karl French'26 and wife; H. W. Geyer'26 and wife; George M. Cunningham'27 and wife; Hall L. Hibbard'28 and wife; Robert W. Hunn, Jr.'28 and wife; Louis C. Miller'28 and wife; Harry E. Shoemaker'29; Harold L. Levinton'30 and wife; Chauncey J. Hamlin, Jr.'31, wife and son; Carl O. Svensson'31; C. C. Dubbs'35 and wife; William P. Kennedy'36 and wife; John B. Pitkin'37; Andrew A. Fogliano'39 and wife; J. E. Hawkes'39; Alex R. Laker'39; William K. Overturf'40; Milton Abel'41; J. J. Quinn'42 and wife; Jerald O. Johnson'44 and wife; Joseph L. Kaufman'44; Robert Nicolait'44; Caroline Swift Turner'45; George K. Turner'45; Stanford D. Blitzer'46 and wife; R. J. O'Donnell'46; Mario Vinci'46; Howard B.

Boreham '47 and wife; Edwin A. Cavanagh '47 and wife; John D. Goldson '47; Bertrand D. Langtry '47 and wife; Frank E. Guptill, Jr. '48; Judith B. Turner '48; and guests as follows: Jeanne Sharp, Mrs. N. R. Robeson, Miss Ann Carman, Nicholas B. Bobrick, Mrs. Bobrick, W. M. Hawkins, the speaker of the evening, and Mrs. Hawkins, C. C. Colyer, Robert B. Allen and Mrs. Allen. — **HIRAM E. BEEBE** '10, *Secretary*, 1847 North Wilcox Avenue, Hollywood 28, Calif. **KENNETH D. KAHN** '15, *Review Secretary*, 2269 Canyon Drive, Hollywood 28, Calif.

M.I.T. Club of Southern Texas

During the early part of November, our Club President said he was withdrawing from all club affiliations and active business with the intention of going to Tucson, Ariz., after a month or two, "to take life easy from now on." This hope was not realized due to the poor condition of his health. It is with sincere regret that we must inform you of the death on December 14 of Joseph Allan Tennant '13, President of our Club. He had many friends, and his passing is a great loss to all. — **JOSEPH M. McEVOY** '21, *Secretary*, 202 McGowen Avenue, Houston 6, Texas.

Washington Society of the M.I.T.

The Society held its third dinner meeting of the season on December 1. Fifty-three attended, including members, their wives and friends. Lowell Ragatz, professor of European history at the George Washington University, spoke on "Behind the Headlines from Europe." Dr. Ragatz recently returned from a year's work in Europe where he visited England, France, the Netherlands, Switzerland, Italy, Spain, Portugal and the Scandinavian countries. He discussed the political, economic and social situations in each of these countries and in Germany. He feels that England and the Netherlands are showing improvement and working their way toward better conditions. The Society is indebted to Dr. Ragatz for his entertaining and enlightening presentation of the European situation.

Present were: G. L. Arnold '30, H. M. Baxter '17, A. D. Beidelman '15, A. E. Beitzell '28, J. R. Bloom '30, Miss M. E. Brown '43, L. W. Conant '21, I. W. Finberg '31, J. A. Furer '05, Lester Glickman '32, L. J. Grayson '19, A. S. Heyser '26, A. M. Holcombe '04, J. E. Howarth, Jr., '29, Ralph Ilsley '25, E. F. Kriegsman '05, B. E. Lindsly '05, W. K. MacMahon '22, W. H. Martin '11, Mrs. O. C. Merrill '05, F. W. Milliken '04, G. D. Mock '28, John Nolen, Jr., '20, J. A. Plugger '29, F. S. Pohanka, Jr., '44, Willard Roper '38, M. P. Smith '19, Miss M. O. Soroka '26, H. B. Swett '25, N. P. Stathis '29, G. W. Stone '89, R. K. Thulman '22, F. W. Turnbull '30, H. E. Weihmiller '25, W. E. Wentworth '16, F. W. Willcutt '27. — **ALBERT F. BIRD** '30, *Secretary*, 5070 Temple Hills Road, South East, Washington 20, D.C.

The M.I.T. Club of Western Pennsylvania

The third meeting for the 1948-1949 season of the Club was held at the University Club in Pittsburgh on November

16, 1948. After an excellent dinner, George M. Hoffman '28, Chairman of the entertainment committee provided entertainment for the evening which consisted of motion pictures supplied by the courtesy of the Allis-Chalmers Company. Those in attendance were: W. C. Baton '04, H. L. Bone '17, E. A. Soars '21, L. H. Bailey '25, W. M. Davidson '26, W. Goodridge '26, Mark Greet '26, P. W. Robinson '26, R. D. Hoak '28, George Hoffman '28, W. R. Jackson '30, Henry Rockwood '32, A. Redcay '34, W. J. Bates '35, G. C. Morrisette '35, P. R. Toolin '39, W. K. Bodger '40, T. F. Reed '40, E. Judson Cole '44, Ralph Evans '48, W. C. King '48.

The fourth meeting for the 1948-1949 season was the usual buffet dinner at the University Club on December 16, 1948. The section was delighted to have H. E. Lobdell '17, Executive Vice-president of the Alumni Association, as guest speaker. Lobbie spoke to us about "M.I.T. on the Verge of 1950." He supplied his typical genial answers to any and all questions shot to him in regard to most phases of the activities at the Institute. We all came away much better informed as to the hopes and ambitions of M.I.T. for the future as well as to its present activities. Those attending were: W. U. C. Baton '04, T. Spooner '09, R. E. Zimmerman '11, H. H. Hall '14, R. V. Davis '16, H. E. Lobdell '17, E. M. Barnes '23, G. M. Frank '23, R. C. Rankin '23, C. M. Boardman '25, C. A. Giblin '25, H. C. Hoar '25, W. M. Davidson '26, M. M. Greer '26, W. C. Hemeon '26, J. P. Larkin '26, Raymond Mancha '26, C. T. Barker '27, D. W. Dimock '28, D. S. Fraser '28, R. D. Hoak '28, G. M. Hoffman '28, H. M. Baker '30, Eugene F. Lynch '32, J. L. Thistle '32, A. T. Mason '33, Bill Murphy '33, A. K. Redcay '34, F. G. Richards '34, W. J. Bates '35, F. L. Current '37, B. G. Tremblay '39, W. K. Bodger '40, T. F. Reed '40, C. F. Peck, Jr., '41, E. J. Cole '44, A. A. Winslow '47, W. C. King '48. — **THOMAS F. REED** '40, *Secretary*, 232 Maybrick Avenue, Pittsburgh 16, Pa.

CLASS NOTES

• 1886 •

In the January issue of *The Review* the names of those '86 M.I.T. and S.M.A. men who had not replied to my circular letter of the fall of 1947 were given in hope that it might stir up some more information from the members. As a result, word has been received from the following: Fred M. McGraw, Vernor F. Worcester, Howard B. S. Prescott, and Fred A. Whitney. This last was from the attorney for Whitney's executor who wrote that Whitney died on March 15, 1948, leaving a widow, Frances M. Whitney, living at 97 Merriam Avenue, Leominster, Mass., a daughter, Doris G. Whitney of the same address, and a son, Hobart A. Whitney, 1420 East Jackson Street, Pensacola, Fla. The daughter answered my letter of sympathy by sending me a newspaper clipping, reading in part as follows: "Fred A. Whitney, 81, of 97 Merriam Ave., a retired paper-box manu-

facturer, died yesterday afternoon at Leominster Hospital after a long illness. Born in Leominster, he had been owner of the Whitney Company. He was a member and Past President of the Rotary Club, a trustee at Leominster Hospital, a director of the Leominster Savings Bank, a member of the Chamber of Commerce, Unitarian Church, Leominster Lodge of Odd Fellows, and Leominster Sportsman's Association." Charles H. Herrick, Secretary, S.M.A., with which Whitney was affiliated, states in a letter to me: "He (Whitney) was a popular member of the Class, never missed a reunion or meeting and was always 'the life of the party.' His career was a long, useful and successful one, both personal and business, and he was well liked and respected. He will be greatly missed by his classmates, relatives, friends and business associates."

McGraw writes a longhand letter from his farm in Gaithersburg, Md., which indicates he is still master of his soul and is not dependent upon a secretary. His hand is firm and shows no sign of age. He writes: "I am still living on my little farm in the center of Montgomery County, which bounds the District of Columbia on the north and west. Sixteen acres keeps an old fellow busy these days with over 80 years behind him and practically no help available. It is no cinch even if it is kept up half way. . . . We have a very comfortable house which replaces the old house that was burned in 1917. I lost my most valuable possession, a good wife, two years ago, but my youngest daughter stepped right in and took charge with her family of five, which has proved wonderful for me. I have eight grandchildren, ranging from three to 16 years of age." He apologises for not being able to write "something that will be of interest," but how could he write anything more interesting to his old friends and classmates?

Vernor F. Worcester writes from Sanford, Maine, saying: "For the first 27 years after graduation I was attached to the mechanical department of a large manufacturing company in Vermont. In 1914, being in poor health, I resigned with the expectation of traveling in foreign countries, but the First World War . . . made travel impossible." Later, he reports, he traveled extensively and visited the more distant parts of the world. His health remaining poor, he divided his time between Maine and Florida until that was too strenuous; then he moved to Sanford for good "where I am living a somewhat secluded life, suffering from a full measure of the infirmities common to old." He reports that he has never married, but omits to state whether he is glad or sorry for the omission. The Secretary, who has had the good fortune to marry the two best women in the world, is sorry for him and suggests he reconsider his present situation. It may not be too late even yet! In closing he writes: "For the past 62 years I have followed the progress of the Institute, both in size and prestige, and can only hope that it will continue to grow in the years to come." The Secretary trusts he has the Alumni Fund in mind!

From the daughter of Prescott, the Secretary learns that her father had a slight stroke on last New Year's Day and has

been confined to a rest home at 45 Pelham Street, Newton Center, Mass., ever since. He has recovered mentally almost to normal, but is up only a few hours each day. She states he retired from his business as an architect in 1934 after having served on the Arlington Planning Board for a number of years. He designed many school buildings, among them being a high school in Arlington and schools in Weymouth, Amesbury and North Attleboro. He is a member of the local chapter of the Arlington Masonic Lodge. — The Secretary makes the following statement of his receipts and expenditures to December 18, 1948. Assessments to date by 21 members: \$21.00; Payments, postage and printing: \$8.02; expense at Council meeting of March 31, 1948: \$4.50; balance on hand December 18: \$8.48. — ARTHUR T. CHASE, Secretary, Post Office Box 4, Island Creek, Mass.

• 1890 •

From the elaborate pamphlet covering the dedication of the Palomar Observatory, is quoted a portion of the address by Lee A. DuBridge, President of California Institute of Technology: "The Board of Trustees of the California Institute of Technology hereby resolves that the 200-inch telescope of the Palomar Mountain Observatory shall hereafter be known as The Hale Telescope. By this action the Board of Trustees seeks to recognize the great achievements of Dr. George Ellery Hale (1868-1938) who served as Director of the Mount Wilson Observatory from 1904 to 1923, who served as a member of the Board of Trustees of the California Institute from 1907 to 1938, who originated the bold conception of the 200-inch telescope, and whose brilliant leadership made possible its design and construction. As this great instrument probes the secrets of the universe, it is fitting that it should stand also in memory of the great scientist and the great leader who contributed so brilliantly to the science of astronomy and who served so ably his community and his nation." A bronze plaque has been placed below his bust, in the foyer of the building, inscribed: "The 200-inch telescope is named in honor of George Ellery Hale whose vision and leadership made it a reality."

Frank Greenlaw spent two months in England and Scotland last summer and says he had a wonderful time. He has been kind enough to send us the following very enlightening notes: "As I have an honest face, I hope, the customs man at Liverpool took my word that I was not bringing in cigarettes or liquor and did not even open my baggage. I had an early experience with red tape. It took an entire afternoon at Glasgow to get the identity card and ration books, required of all tourists staying more than 30 days. An example, the minute regulations in force are that a man who needs a fresh blotter for his office desk has to get permission from three separate authorities before he is allowed to purchase one. Shortages are painfully evident. Hotels do not provide napkins. The lavatory in a large hotel will have a single roller towel which is a sad sight at the end of the day. Guests are

allowed one towel per week; a cheap cotton bath towel. Breakfasts are usually adequate if a man likes porridge and kippers. Lunch and dinner are restricted to three courses; hors d'oeuvres or soup, a meat course and a sweet. One has to fill up on potatoes to get the feeling of having dined. Taxes are very heavy. A glass of beer costs 34 cents; an ounce of smoking tobacco, 82 cents; a pack of 20 American cigarettes, 70 cents and hard to get at that price. Food was much better in the north of Scotland. I had, on occasion, venison, grouse and rabbit, and fresh eggs instead of egg powder. There was little unemployment. An experienced textile worker gets up to 8 pounds per week. A first-class machinist up to 5 pounds per week. Food is heavily subsidized. Butter is sold to those who have enough points at 34 cents per pound. The government pays 80 cents to import it. Production per worker is low, and labor resists anything approaching a speed up. The Austin Company introduced some American machines which reduced the number of operations in gear cutting from seven to two. The workers promptly called an unauthorized strike in opposition to the proposed piece rate and were out for two weeks. Coal mining is hampered by absenteeism which reached 26 per cent during the holiday season. There is widespread opposition to the labor government, including editorial criticism in many papers. Polls show that the government has the support of not more than 44 per cent of the workers. Many of the people hope that the government will be ousted in 1950 but we know how unreliable polls can be. I returned by air and enjoyed it; my first flight, by the way. I am still impressed by the fact that I left London Airport at 4:30 P.M. and reached my home in Newport at 11:15 A.M. the following morning."

Charlotte Bragg writes: "I have accepted a small responsibility for the housing shortage by renting my house in Marblehead as an all-the-year-round house. Am very comfortable and content at 271 Dartmouth Street, Boston, which was the Victoria and where I think Dr. Drown lived." — William P. Flint is now at 3726 First Avenue North, St. Petersburg, Fla. — GEORGE A. PACKARD, Secretary, 53 State Street, Boston 9, Mass. HARRY M. GOODWIN, Assistant Secretary, Room 5-213, M.I.T., Cambridge 39, Mass.

• 1894 •

In my last notes I mentioned my regret at not seeing John C. Nowell when he was in Massachusetts last summer to visit his daughters. A note enclosed with his Christmas card has provided the explanation. While he was staying in Gloucester he suffered an attack of that particular form of trouble commonly called gout and was housebound for some weeks. As a result, he was not able to visit some of his friends hereabouts. I am happy to say that he is in good health and condition again, and can drive his car and walk about his lovely place in San Mateo with comfort. I hope to see him and Sperry and other Technology men within the next six weeks as I am due at a meeting in San Francisco on February 6 to February 9, as chairman

of the Board of Governors of the Refrigeration Research Foundation. — John N. Ferguson has changed his address to 646 34th Avenue, South, St. Petersburg, Fla. Any of the Class visiting this mecca of active old people should look him up. Fred C. Baker, long a resident of Natick, has also moved, and may now be addressed at Lock Box 303, East Templeton, Mass. The Secretary has been happy to receive Christmas greetings from many classmates, especially those who have been so constant in attending class reunions and Alumni Day celebrations when we have been able to keep the fires of friendship burning.

It is with deepest regret that I have to report a loss to the Class by the death of Albert Ball Tenney, II, which occurred at his home in Lexington on December 5. For the past two years his health had been gradually declining, and his activities much limited, but it was a shock to his friends when a cerebral hemorrhage brought the end, fortunately without a long period of suffering. Tenney was born in Everett, Mass., on January 3, 1871, and was a graduate of the Chelsea High School. Tenney was one of the best-known and most beloved members of the Class, and from its beginning, when we were freshmen in 1890, he took a deep interest in its affairs and was one of our undergraduate officers. This interest continued unabated after graduation, and he served at least one five-year period as class president, and was always active on our five-year reunion committees. For the past three years, until his poor health demanded his resignation, he was the Class Agent for the Alumni Fund. Al, as he was known to all of us, had a busy and successful career as an engineer and administrator. In the first few years after graduation he held positions with Lockwood, Greene and Company, mill architects; the Boston Rubber Company; the N. V. Perry Company, manufacturers of automatic screw machinery in whose employ he patented several devices and mechanisms; and others. His employment then became concerned with public utilities, and in this he continued throughout his active career. He was vice-president of the Malden Electric Company, and later the Suburban Gas and Electric Company, where he had charge of high tension transmission and distribution, and of the development of power stations. He had served as president of the Brockton Gas and Light Company, and the Standard Crayon Manufacturing Company, and as director of the Concord Electric Company, Rockland Light and Power Company, Springfield Gas Light Company and Springfield Navigation Company. He was a member of the American Society of Mechanical Engineers and of numerous local technical societies and clubs. He was administrative head of the New Hampshire Traction Company, and of the Portsmouth Gas and Electric system, and became a director and later vice-president of C. H. Tenney and Company. Previous to the first World War he attended the first Plattsburg Camp in 1915, and after the United States was in the War he served as Toluol expert for the ordnance department. He was also a member of the district board number five of the Massachusetts Selective Service. Dur-

ing and after World War II he was a member of the Lexington Rationing Board. In recent years he had maintained a Boston office at 3 Joy Street in connection with his public and private interests.

In 1902 Tenney married Mary Augusta Comey of Lynn and they established their home in Lexington in September, 1910. Here they had been active in welfare, social, and charitable affairs, and Tenney was for a time one of the selectmen and rendered valuable service in this duty of citizenship. They have an adopted daughter, Mrs. Halsey L. Ford, of St. Petersburg, Fla., to whom they have been devoted foster parents since their early married days, and a son, Richard H. Tenney, commander, U.S.N., now of Washington. Tenney and his wife traveled widely by land, sea, and air, covering most of the Western Hemisphere, and by cruises around the world. They also greatly enjoyed a life near to nature, and for years had a camp on a lake near Wolfeboro, N. H. Tenney was an ardent trout and salmon fisherman, and for 18 years was president of the St. Bernard Club, one of the famous fishing clubs of northern Quebec, to which he made an annual pilgrimage as long as his health permitted. When not away, Tenney was constant in his attendance at Alumni gatherings, and strong in his support of Technology projects. He rarely missed one of our reunions, and always added greatly to their success by his good fellowship and keen participation in the famous class golf tournaments which were a feature of our five-year reunions for many years. He will be very greatly missed when we meet in 1949, and at all other gatherings of the Class. To Mrs. Tenney and all his family the class sympathy is most sincerely extended. — SAMUEL C. PRESCOTT, *Secretary*, Room 5-213, M.I.T., Cambridge 39, Mass.

• 1895 •

Information received from Miss Laura C. Johns of Sedalia, Mo., niece of Richard Morey, tells of his passing on January 20, 1948, following a heart attack. Morey was retired from business and made his home with his niece for the past 14 years. — Fred W. Harris, XI, has moved to 17 Highland Place, Great Neck, Long Island, N.Y. He and Mrs. Harris planned a 6 months' trip to Mexico City to visit their son who is sales manager for the Fairbanks Morse Company of Chicago. We hope to get a few personal impressions of Mexico City on his return to the States. — Fred B. Cutter '98 has shaken off the dust of Church Street and Fifth Avenue, New York, and retired to private life as a genuine Yankee. He and Mrs. Cutter now live at 120 Institution Avenue, Newton Center, Mass. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass.

• 1896 •

Charles W. Tucker of Mill Road, North Andover, Mass., died at Lawrence General Hospital following an acute kidney infection. The following attended the funeral service on December 10: H. S. Baldwin, H. C. Lythgoe, M. W. Partridge, Mrs. Perry Howard, Mrs. Eugene Laws and Dr.

and Mrs. J. A. Rockwell. Charles W. Tucker was born in North Andover on May 22, 1872. He was educated in the public schools of North Andover and Andover and was graduated from Technology with the B.S. degree in Chemistry. For nearly 25 years he occupied the position of research chemist and superintendent of the manufacture of leather for ladies' shoes. He retired from this industry in 1924. Since that time his principal vocation had been fruitgrowing; his avocation, genealogical research in this country, England and Bermuda and historic land title research.

He was registrar of the Brigadier General Joseph Frye Chapter of the Sons of the American Revolution, and for the past four years he had been registrar of the Massachusetts Society, Sons of the American Revolution. He was genealogist general for the National Society, Sons of the American Revolution from 1946 through 1948. He was also a member of the American Chemical Society, the New England Historic Genealogical Society, the Essex Institute, the Society of Colonial Wars, second vice-president of the North Andover Historical Society, Trustee of Hillside School for Boys in Marlboro and a member of the Trinitarian Congregational Church. In 1898 he married Gertrude C. Mason of Andover who died in 1934. His second wife was Bertha M. Smith of Lawrence. His sons, Charles M. Tucker '22 and George R. Tucker '25, died in 1943 and 1933, respectively. His daughter, Helen F. Tucker '33 is a research chemist for Rohm and Haas Company in Philadelphia. His wife and daughter sent the following note: "Will you please express our appreciation to the members of the Class of 1896 for sending the beautiful spray of white chrysanthemums. It has meant much to us at this time and has helped to give us strength and courage. We shall always welcome a visit from any members of the Class who might be traveling in this direction."

The Secretary has received many notes from classmates indicating their great love and devotion to Charles Locke and their intention of supplying this column with whatever news is of general interest to the Class. I wish to acknowledge such friendly co-operation at this time. It has been suggested, among other things, advisable to appoint an assistant secretary to share the obligations which this office entails. I am pleased to co-operate and suggest the name of Fred Damon whom I see frequently and in whom I have every confidence.

Welles Mortimer Partridge is at the Starrow House in Lincoln, Mass. This is a convalescent home connected with the Massachusetts General Hospital. Herman Lythgoe brought him to the Tucker funeral and the Secretary returned him to Lincoln. It was a demonstration of unusual devotion as he was, frankly, too ill to leave the house. At present he is back to normal. — Fred Damon celebrated his 75th birthday with a golf game and a surprise dinner at the Weston Golf Club. We quote Fred: "Never felt better in my life." — James Driscoll was confined to his bed on December 10 with a back injury requiring a cast for suitable support. Take note,

classmates, and do not attempt to lift a car to disengage it from its "locked horns" condition with another car. — Walter Stearns is just recovering from a dual cataract operation. As usual, he is cheerful and looking forward to greater facility in accomplishing his days occupation. He writes from Haywood Hall, Raleigh, N.C. — Bill Coolidge continues to make headline news. An x-ray laboratory, largest of its kind, has just been dedicated with his name and very suitable comment enumerating the many inventions and consequent benefits to mankind which his keen observations have made possible. — The New York '96 group are planning another February dinner meeting which your Secretaries have attended these many years. They feel very conscious of the fact that Charlie would wish the custom continued. — Albert E. Cluett died on January 3 after a long illness. He was 76 years old. Further details will appear in the March issue. — JOHN A. ROCKWELL, *Secretary*, 24 Garden Street, Cambridge, Mass.

• 1898 •

Although there has been a gap in class notes since November, 1948, work has been going on behind the scenes. The pamphlet describing the Golden Anniversary, after some unavoidable delays, is at the printers and should be forthcoming at an early date. Our energetic and originality-minded President, Van Rensselaer Lansingh, has taken his new responsibilities greatly to heart, and by travel and correspondence has been perfecting the '98 organization. Here is the result to date for your files: Van Rensselaer Lansingh, President, 500 Fifth Avenue, New York; Daniel W. Edgerly, Vice-president, 76 East Monroe Street, Chicago, Ill.; Howard L. Bodwell, Vice-president, 7501 Olivetas Avenue, La Jolla, Calif.; Karl W. Waterson, Treasurer, 56 Whittredge Road, Summit, N.J.; Edward S. Chapin, Secretary, 463 Commercial Street, Boston 13, Mass.; Joseph C. Riley, Assistant Secretary, 9 Pond View Avenue, Jamaica Plain, Mass.; Advisory Council: Roger W. Babson, 17 Prescott Street, Wellesley, Mass.; George T. Cottle, 15 Copley Street, Roxbury, Mass.; Lester D. Gardner, 251 West 101st Street, New York 25, N.Y.; George W. Treat, 75 Federal Street, Boston, Mass. It's a long cry from "the wonderful one hoss shay," one lone Secretary writing his fingers off, to this modern streamlined Diesel engined train, or, to change the metaphor, to a group patterned on large corporation practice. We haven't decided yet whether to buy half of New York and run it for the benefit of the Class and of the Institute or just to travel along smoothly and sensibly toward the 55th.

Since our Golden Anniversary, two classmates have passed within the Unseen Temple: Alpheus A. Packard and Charlie Wing. The former was unable to attend the Golden because of infirmity; Charlie was there, his usual gay self. The newspaper notices follow. In the Boston *Herald* of August 8: "Andover, Aug. 7 — Alpheus Appleton Packard, 77, retired naval architect, engineer and teacher, died today at his home, 1 Orchard Street. Born in Salem, the son of Prof. Alpheus Spring Packard

and Elizabeth Walcott Packard of Providence, he attended Brown University and was graduated from . . . Technology in 1898. An ardent yachtsman and ship designer, he was associated at various times with the Herreshoff boat building firm, the New York Shipbuilding Company and with architects W. Starling Burgess of Marblehead and Frank C. Paine of Boston. As a professor of physics, he taught at M.I.T. in 1916-17, and at Syracuse University and St. Stephen's College in Annandale, N.Y. He was an engineer during the first World War for the Foster-Armstrong Company and the Taylor Instrument Company, both of Rochester, N.Y. For several years after 1924, he was with the Allied Chemical Company of Syracuse, N.Y. He leaves a daughter, Mrs. A. C. W. Bahnsen of Merrick, L.I., N.Y.; two sons, Richard M. of Auburndale, and the Rev. A. A. Packard, Jr., of West Park, N.Y., and two sisters, Mrs. P. W. McClellan and Miss Martha W. Packard, both of Andover."

The following appeared in the New Bedford *Standard-Times* of September 29: "Charles F. Wing, Jr.; 72, treasurer of C. F. Wing Company, died suddenly last night at his home at 63 Morgan Street of coronary thrombosis. He had been in poor health for several years, but was downtown yesterday, apparently feeling well. A descendant of the Wing family which settled in Sandwich in 1630, Mr. Wing was born in New Bedford, July 2, 1876, son of Charles F. and Averic (Tripp) Wing. He was graduated from Friends Academy and took a degree in electrical engineering at . . . Technology. After working a year or two for the Boston Street Railway he returned to New Bedford to go into business with his father. For some years the carpet department of the store was his particular concern. A charter member of New Bedford Board of Commerce, Mr. Wing was one of the earliest chairmen of its retail division and served several times on the board of directors. He was at the time of his death a member of the governing board of the industrial development division. Mr. Wing was a Unitarian, a Mason, and a member of the Wamsutta Club. He was a past president of New Bedford Rod and Gun Club and for years was an ardent fresh-water fisherman. Survivors are a daughter, Mrs. Averic Barker of this city, three grandchildren, a great-grandson born this week, and three brothers, William L. of Boston and Edward H. and Richard L. of South Dartmouth. His wife was the late Sara (Cornell) Wing." We shall miss our merry, vivacious classmate. — We have received news of the recent passing of the wives of two of our classmates, Mrs. Charles W. Pendell and Mrs. William R. Strickland. In the absence of fuller information, we wish to assure our classmates of the sympathy of the Class. We have received from Elliot Barker an interesting autobiographical sketch of the life of John Dixon, well known to Course V classmates. Thanks, Elliot, for the sketch which will be published in due course.

And here's a real laugh! Our indefatigable Lester, not being content with the herculean labors for the Golden, last spring as a side issue undertook the publication of a pamphlet for the Society of Colonial

Wars. Again, thousands of letters. The result is a pamphlet of 120 pages, entitled, *A Brief History of The Colonial Wars in America from 1607 to 1775*. An intensely interesting description of events, with numerous striking pictorial illustrations, from the settling of Jamestown, Va., on May 3, 1607, to the Treaty of Paris ending the French and Indian War, on February 10, 1763. Recently, Lester has collaborated in the preparation of the Wright Brother's issue of *Collier's* of December 25, 1948. There's another author in the Class. Ernest A. Bragg has recently compiled and published, *A History of Methodism in Milford, Mass., 1792 to 1948*. Thanks, Ernest, for this interesting history. It must have taken years of patient research to bring together the myriad details of this period into a coherent whole.

Our distinguished classmate, Roger W. Babson, is quoted so frequently and at such length in the press all over the country, that it is impossible to report this adequately within the limited compass of the class notes. Here is a comment by the columnist, Morgan Blake, that appeared in the Atlanta, Ga., *Journal* of June 13, 1948: "Amazing Predictions. In an address at a class reunion of . . . Technology, Mr. Roger W. Babson, the economist, made some spectacular predictions as to methods of transportation in the not-too-distant future. Mr. Babson says that 50 years from now men will be able to fly bird-like. Some scientist, he said, would 'discover some product which is insulated against gravity.' This, he told his former classmates, 'would make it possible for an individual to stand on something three feet square and a few inches thick and eliminate his weight so that he could fly personally with or without the aid of a motor.' But far more amazing than this — he told the goggled-eyed listeners — that some day we'll be able to make city-to-city trips — say from Boston to New York — without ever leaving Boston. We'll do it, he said, by 'transferring our entire bodies' much the way our voices now are carried across the ocean by wireless. . . ." — EDWARD S. CHAPIN, *Secretary*, 463 Commercial Street, Boston 13.

• 1899 •

Further details regarding Clifford M. Balkam, whose passing was referred to in a recent issue, have been received through the courtesy of his wife, Clara S. (Matten) Balkam. Both Clifford and his wife are of New England stock, Clifford having been born in Randolph, Mass., and his wife in Newport, Vt. Because of his health, Clifford, after his marriage in 1903, moved to Colorado Springs. For nearly a quarter of a century he was secretary-treasurer of the Colorado Springs Stock Exchange of which he was one of the incorporators. Clifford's death was caused by a cerebral hemorrhage. His life seems to be an early example of the fact that tuberculosis, early diagnosed and properly treated, can be arrested with the co-operation and determination of the patient who can subsequently live a long and useful life. Besides his wife, Cliff left a daughter, Barbara. His sister, now deceased, was the wife of another Technology Alumnus, Henry H. Valiquet '03, II.

Ralph H. Pinkham, I, of Evanston, Ill., is located at 712 South East 7th Street, Fort Lauderdale, Fla., for the winter months. — Edmund T. Stewart, IV, formerly of Rye, N.Y., is now living at 272 North Avenue, New Rochelle, N.Y. — BURT R. RICHARDS, *Secretary*, 381 State Street, Albany, N.Y.

• 1900 •

The following is from the Boston *Herald* of December 18: "James L. Little, 3d, of Boylston Street, Brookline, a retired Boston architect, died Thursday, in Washington, according to word received here today. He was 74. Born in Boston, he was graduated from Noble and Greenough School, and from Harvard in 1897. He was a special student in the department of architecture of . . . Technology, from 1897 to 1900. He also studied at L'Ecole des Beaux-Arts, in Paris, in 1902, and began his career as an architect in Boston in 1904. He was a member of the firm of Little & Russell when he retired, in 1940. He planned the University of Maine field house. He was a former member of the Brookline planning board, a fellow of the American Institute of Architects, and a member of the Boston Society of Architects and of the Union Club. He leaves his wife; a daughter, Barbara Robbins; a son, James L. Little, 4th, of Salem, Ore.; and a brother, Dr. Clarence C. Little, director of the Roscoe B. Jackson Memorial Laboratory, Bar Harbor, Me." — ELBERT G. ALLEN, *Secretary*, 54 Bonad Road, West Newton 65, Mass.

• 1904 •

In the last edition of the class notes the matter of a 45th reunion next June at East Bay Lodge was mentioned and comments were requested. Up to the present time there has been an abysmal silence on this subject or, in fact, on any other subject, so this edition of the notes will be very brief. Please keep the matter of a reunion in mind, however, and let us know if you favor one. — Ed Parker called on Henry Stevens recently and had a pleasant visit. Steve has his good and bad days and Ed, fortunately, found him on a good day. Perhaps some of the '04 men would like to drop Steve a card now and then. He is nicely situated at Whitney Homestead, Stowe, Mass.

There are only three other items to record and these are sad ones, being notices of the deaths of three classmates, Ed Tripp, Ed Allbright, and Jack Draper. We learned of the death of Ed Tripp through the alumni office. The date given was October 31 but no other details are available. — Ed Allbright lived in Quincy, Mass., and was stricken with a heart attack on November 12 while walking near his home. He had been associated for some years with the Grid Flat Slab Corporation in Dorchester. Ed was a member of the Squantum Yacht Club and was quite a yachtsman. His son Herbert '31 was even better and took various prizes on the water. Mrs. Allbright is still living as are also two sons and a daughter. They all have our deep sympathy.

Jack Draper was one of the faithful few

who regularly attended alumni gatherings and class reunions and will be greatly missed by others of this group. News of his death in Florida has just arrived as these notes are being written and few details are available. The following item appeared in the Boston *Herald* of December 18: "John Howard Draper, senior member of the Draper Brothers Co., woolen manufacturers of Canton, Mass., died today at his winter home. He was 65. Born in Canton, he attended the old Chauncy Hall School in Boston and . . . Technology. He entered the employ of the Draper company in 1902. He was president and treasurer of the firm until 12 years ago. He continued as vice president and spent the past 12 winters at West Palm Beach. He was a director of the Norfolk Country Trust Company of Canton and a former treasurer of the First Congregational Church of Canton. He was a member of the Blue Hill Lodge, A.F. and A.M., of Canton; the Stoughton Royal Arch Chapter, the Hyde Park Commandery, Knights Templar, and Aleppo Temple. He leaves his wife, Mrs. Florence Draper; two sons, Charles N. of Cornish, Me., and John H. Jr., of Canton; two daughters, Mrs. Martha French of Canton and Mrs. George Welsh of Philadelphia, and three brothers, Joseph P., Paul A. and James B. of Canton. . . ."

—EUGENE H. RUSSELL, JR., 82 Devonshire Street, Boston 9, Mass. CARLE R. HAYWARD, Room 8-109, M.I.T., Cambridge 39, Mass.

• 1905 •

The big news in Boston this month was that Clarke Warren, II, of Chicago came into town, notifying us in time so that we could have a bit of a class reunion. Seven of us had lunch at the M.I.T. table at Thompson's Spa on Friday, December 3, including John Ayer, I, Files, I, Ball, III, Shapira, III, and Strickland, IV. Clarke seemed not to have changed too much since we last saw him, but has a dapper mustache and spirit. He visited his son and daughter-in-law in Newtonville; Junior having established himself in this section a short while ago representing manufacturers of rubber goods. During spare moments, Clarke, Sr., hob-nobbed with old pals, Andy Fisher, Al Prescott and Harold Merrow '06. Warren is president of the Mackie-Lovejoy Manufacturing Company of Chicago, and if you ask him what they manufacture, he says "gadgets," principally clothes hangers ("Setwell"-plug). John Ayer says that Fred Abbott, VI, is associated with his firm, Fay, Spofford and Thorndike, but operating independently as electrical consultant.

T. Shaw breaks a long silence to tell us of his retirement from the American Telephone and Telegraph Company with the title of assistant vice-president. Perhaps the following extract from the November, 1948, issue of the *Bell Laboratories Record* best tells the story of his business life and achievements: "Thomas Shaw was born in old England but his most formative boyhood years were spent in New England, right where the history of New England began, at Plymouth, Massachusetts. His family settled there when he was twelve, having moved to America when

he was eight. At seventeen Mr. Shaw first became a Bell System employee, and admits he slept on the job, since the telephone company furnished a bed for its night operator shift of seventy-two hours per week. The subscribers evidently slept well, and serving them did not keep him from school attendance or from a nine-hour day job during one summer vacation. He graduated in 1905 with the B.S. degree in Electrical Engineering from . . . Technology. One of his instructors was a young man named Frank Jewett. When Dr. Jewett appeared with an enthusiastic recital of developments he had undertaken in Boston for the American Telephone & Telegraph Company, Mr. Shaw signed up immediately with that company. The 'loading' of telephone lines was then the outstanding project in telephone transmission development, and Shaw was selected to work on the new forms of coils required. Thus began his career as an expert in the many forms and applications of inductances and coils.

"In September, 1907, the headquarters of the company transferred from Boston to New York; Mr. Shaw is one of the last two, in active telephone service, of the engineers involved in the move. For many years, development work on loading constantly increased in importance. Mr. Shaw and the group of engineers who assisted him were the center of the loading coil work in the American Company. . . . Mr. Shaw's twenty-one patents, of which eight are joint with others, suggest the pioneering character of the work which was being done. Mr. Shaw's first published paper was in 1914, on 'Neutralizing Transformers and Their Use in Telephone Circuits,' in *The Electric Journal*, published by the Westinghouse Electric & Manufacturing Company. It concerned the overcoming of induced voltages from electrified railways, a subject to which Mr. Shaw made very valuable contributions. In 1926, on the twenty-fifth anniversary of the commercial application of loading, Thomas Shaw for the American Company and William Fondiller for Bell Telephone Laboratories were the joint authors of a sixty-page definitive article on 'Loading for Telephone Circuits.'

"Mr. Shaw's paper on 'The Conquest of Distance by Wire Telephony,' published in the *Bell System Technical Journal*, October, 1944, first disclosed him as an accomplished historian and author. This paper was written to commemorate the retirement of Dr. Jewett. The editorial foreword to the paper, after stating the decision to have such a paper written, states 'the task of compiling the history has fallen upon the shoulders of a single individual, and we believe a very competent one. Mr. Shaw is to be congratulated in capturing to an unusual degree the spirit of the period which intervenes between the introduction of the loading coil and the completion of the first transcontinental line. Needless to say, he has been aided by the fact that he was himself a participant in much that he relates.' Mr. Shaw will continue to be a resident of Hackensack, New Jersey. His immediate effort will be directed to finishing a comprehensive history of loading in the Bell System, on which he was working at the

time of his retirement." T adds that he has been a widower since April, 1944, that he has two children, a daughter, Ruth, and a son, Richard. Ruth has two children, aged seven and a half and five and a half years, who are helping to keep him young in spirit.

Frank Chesterman, who was in Boston for a few hours recently for an M.I.T. Corporation meeting reports seeing Charlesworth while in New Hampshire at Thanksgiving. About April of next year Frank and family will take up residence in Hampton Falls, N.H., for the summer, spending the winter in Philadelphia. He writes: "I expect to have plenty to do in New Hampshire because with the new equipment we have and the size of the place, there will be a great many things that will require attention. We expect you to come down to see us and if you see a fellow with a big sombrero riding a tractor, you will know who he is." Thanks, Frank, for the invitation and, answering for the Class, we'll consider Hampton Falls for our 45th reunion.

As this last item is written we learn of the death of Carl H. Graesser, II, at Southport, Conn., on December 18. We arranged for flowers for the funeral and wrote Betty expressing the sympathy of the Class individually and collectively. All details are lacking at the moment, but at last hearing, he was apparently in good health. —FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston 10, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 69 Newbury Street, Boston 16, Mass.

• 1906 •

One of our first Christmas cards was from Abe Sherman who is at the Four Seasons Apartment, Lido Beach, Sarasota, Fla. Under date of December 10 Abe dropped a line to the Secretary suggesting that he follow his example and head south. Abe writes: "It's real warm here, 80 degrees in the day and in the 60's at night. Water in the Gulf is 70 and I have had a swim every day since arriving. Saturday, November 20, I attended a meeting of the Committee on Financing Development at the Institute; Wight, Wick and Terrell Bartlett were there, also. I have not with me the full list of '06 men on the committee but I recall seeing listed: Santry, Means, Burpee, and, I think, one or two more. Not a bad representation for our little Class."

While Terrell Bartlett was in Boston attending this same meeting he telephoned the Secretary. Terrell advised me he was in good health and that he and Mrs. Bartlett had had a trip to Mexico this past summer. Another telephone call was received around Thanksgiving time from Stewart Coey who has a married daughter in Wellesley and, therefore, is quite a frequent visitor to that suburb of Boston. Stewart is engaged in air conditioning engineering and although ordinarily does not spend much time traveling, when an opportunity presents itself to come to Boston he makes the most of it. The Secretary acknowledges a post card received from Chester Hofer mailed in Liechtenstein last summer. Last spring Chester telephoned the Secretary that he and his wife

were leaving on a trip to Europe and the post card was evidence that their plans were carried out.

A letter was received from Herbert Ball dated July 24: "Have recently returned from a trip to England and France where I attended two international conferences on textiles and one national (British) annual textile conference. The schedule of meetings was as follows: June 2 to June 5, at Buxton, England; annual meeting of British Textile Institute, of which I am a Fellow. June 7 to June 12, at Buxton, England, International Standards Organization, to which I was an American delegate of the American Standards Association representing the American Society For Testing Materials. June 14 to June 18, International Silk Congress meeting June 14 and 15 at Lyon, France, transferring on June 16 to Paris for two more days, June 17 and 18. Found the trip a bit strenuous on account of the close timetable of the meetings but very interesting, and I consider that good results were obtained. Living conditions in England under the austerity program were in quite marked contrast to those I found in France where restrictions were much less in evidence." An enclosed clipping points out that Herbert was vice-chairman of the American delegation.

The Manchester, N.H., *Leader* of November 12 included the following in regard to W. L. Rowell, II: "Portsmouth, Nov. 11. W. L. Rowell of Hampton has been elected vice president of the New England Fibre Company of Freeman's Point, Portsmouth, manufacturers of insulation board and acoustical tile. Announcement of his election was made by Earl Watson, president of the company. Mr. Rowell, who is a graduate of . . . Technology with a degree in mechanical engineering, is in charge of consumer research and development of a newly created insulation building board developed by the New England Fibre Company to meet the modern demand for swift constructional units."

The Boston *Globe* of October 11 included a picture of George Henderson, III, and a lengthy article with reference to his resumption of mining engineering. For the last few years George has been operating a filling station in Newton but apparently the old urge to resume mining was too much for him and he sold his business to one of his employees and threw into his car his mud-stained, hobnailed, high-lace boots and his old miner's hard-shelled lamp hat and set off. Destination: the subtropical Southern California peninsula, 50 miles south of the border. Quoting from the *Globe*: "I just can't sit around and get to feeling old with hardening of the arteries' declared the M.I.T. grad. He certainly feels and appears to be in excellent condition. Henderson says his newest gold mine is small but with ore of exceptionally high grade. George Henderson will be 66 on November 2. He won't venture to predict how many active mining business years are in his future. But he makes it plain he feels that retirement is a long way off especially in the warm dry climate of Mexico. He prefers it to New England winters. He offered his services in World War II but was told he was too old. In

World War I he was a lieutenant and captain with the A.E.F. engineers and built bridges and roads in France. In the early 20's he built more highways and even operated a narrow-gauge railroad for the Marines occupying the trouble spots in Haiti. George is a bachelor and while in Newton he lived with his brother at 78 Chestnut St. He has two nephews, Robert and Donald, who are graduates of Tech and also in mining engineering."

Under date of December 15, Otto Blackwell wrote the Secretary apropos of the note in the last Review regarding classmates in the Bell System who have retired. Otto is still on the active list as assistant vice-president with the American Telephone and Telegraph Company in New York and does not retire until after the middle of next year. He advises that Burton Kendall retired from the laboratories at the end of November. The Secretary received an address change for Kendall and he is now located at 67 South Munn Avenue, East Orange, N.J. Otto also thinks that we should have a considerable group of retired Bell System people at the next class reunion as they could not very well plead overwork as a reason for not attending.

Frank Benham went to Miami in January and Henry Ginsburg will be located in that same city, if he is not there already. I have not heard from Ralph Patch but assume he will be at Winter Park as usual. So far, the weather in New England has not been conducive to forcing people south. The Secretary and Frank Benham had a round of golf on December 12. However, the Secretary is always glad to receive news from the ones who are basking in the Florida sunshine and will overlook the fact that the attractive post cards usually arrive here just about the time when our weather is at its worst. — JAMES W. KIDDER, *Secretary*, 215 Crosby Street, Arlington 74, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills 82, Mass.

• 1907 •

A letter dated November 18, 1948, from Otis G. Fales, Vice-president of the Gregg Company, Ltd., 19 Rector Street, New York City, mentions the fact that during the early part of last fall he took a trip to Guatemala. He also tells of spending a short time with Byron Luce and his wife on Martha's Vineyard Island during last summer. From a letter received from James A. McElroy, whose mailing address is Post Office Box 22, Hartford, Conn., I have learned that he is chief civil engineer in the Real Assets division of the Comptroller's Department of the State of Connecticut. This division, corresponding to the department of public works in most states, has charge of all building construction for Connecticut except highways. He is also a member of the Connecticut board of registration for professional engineers and land surveyors.

In the December 6 issue of the Boston *Herald*, I was shocked to see a news item stating that on that same day J. M. Stewart, a lieutenant, of Dartmouth, N.S., son-in-law of our classmate Clarence Howe, Minister of Trade and Commerce for

Canada, was killed when two naval fighter planes collided in the air over Halifax Harbor. I immediately wrote a note of sympathy in behalf of the Class to Clarence and his family, and under date of December 13 received a note from him as follows: "Your kind letter expressing sympathy in the loss of our son-in-law is greatly appreciated by Mrs. Howe and myself, and by our daughter. This first break in our family circle is a shock to all of us. He was a young man of great promise and we were all very fond of him."

Those of you who attended our class reunion at Oyster Harbors Club in 1947 will remember that many of those present enthusiastically suggested the idea of our holding another reunion in 1949 instead of waiting for another five years to 1952. I have been in communication with the management at Oyster Harbors Club and have asked for reservations for us tentatively from June 17 to June 19, 1949. As soon as I receive definite word that these dates will be available, I plan to mail postal cards with paid replies to all of our Class asking the men to indicate whether or not they would plan to attend such a reunion if we should hold one. The decision as to whether or not we shall have such a gathering is entirely in the hands of our classmates. If I receive favorable replies from at least 25 men, we shall undoubtedly proceed to make definite reunion arrangements. If the number who indicate that they will plan to attend is not more than that number, it is doubtful that we shall try to hold a reunion. At about the same time that you are reading these notes, you should be receiving these postal cards from me, and I urge you to please send me your replies at once. Incidentally, you men who were at Oyster Harbors in 1947 and who, consequently, will remember John J. Fitzgerald, manager of the Club, will be sorry to learn that he died on December 13, 1948. He was one of the nation's leading hotel men and had done much to build up Oyster Harbors Club to its present state of excellence in service and equipment. — BRYANT NICHOLS, *Secretary*, 23 Leland Road, Whitinsville, Mass. HAROLD S. WONSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

• 1909 •

Henry Spencer, II, called on the telephone to advise that he and Art Shaw, I, had closed arrangements by which we will take over East Bay Lodge, Osterville, for our 40th reunion. Most of you will remember that we also held our 20th reunion at East Bay Lodge, and we all had a grand time. The dates have been set for Saturday and Sunday, June 18 and 19, a week after Alumni Day. As you may recall, Henry and Art are the committee who have been appointed to take charge of the reunion. They made their decision after consulting several members of the Class and after weighing all the pros and cons. The alumni week end, June 11, was considered but with the dinner that evening, there would scarcely be any time left for Osterville. A midweek period was also considered with the thought that so many had reached the upper brackets in the industrial ladder,

they would have no difficulty in "getting off" at midweek. It was found, however, that many had very important positions and could not be spared at midweek. We are planning to send out preliminary notices which may reach you before this number of *The Review* arrives. In any event, reserve June 18 and 19.

On Tuesday, December 7, Tom Desmond, I, had dinner with the faculty of the Harvard graduate school of engineering at which your Review Secretary was present. The dinner was preceded by cocktails at the home of Dean Fair'16 at the Harvard Dunster House of which he is now master. As we have already stated, Tom is a member of the visiting committee of the school and in his usual efficient manner he makes a preliminary visit to investigate conditions on the spot and discuss the current situation with the faculty so that he will have a good background when his committee meets. Simultaneously, he was spending two days at the Institute where he was conducting meetings of the Visiting Committee of the Civil Engineering Department of which he is chairman. He stated that all but one member, who could not break an important engagement, attended, one coming from the Pacific Coast. Both Harvard and the Institute owe a great deal to Tom for his interest in engineering education and his contributions to it.

Paul writes: "On December 7, under the auspices of the M.I.T. Club of New York, a testimonial dinner was held at the Hotel Biltmore in New York. The following paragraph was included on the program: 'In Tribute. James Rhyne Killian, Jr., [26] Karl Taylor Compton, C. George Dandrow [22]. The M.I.T. Club of New York is honored tonight by the presence of three great personalities, each of whom has made major contributions to the continuing growth of the Massachusetts Institute of Technology. We hold these men in our topmost drawer of affection and esteem. May God give them strength to carry on in their new assignments.' I feel that this party was the most successful affair we have ever had here in New York. The most gratifying thing I can tell you is that over 500 Alumni and wives attended the dinner. I am sure that is a record attendance. Can it be that we M.I.T. men are getting a bit mellower as the years pass? Might be at that! To be sure, the committee provided some fine drawing cards, for we had Dr. and Mrs. Compton on the dais and there were the new President of the Institute and Mrs. Killian sitting beside them." — PAUL M. WISWALL, *Secretary*, 90 Hillside Avenue, Glen Ridge, N.J. CHESTER L. DAWES, *Review Secretary*, Pierce Hall, Harvard University, Cambridge 38, Mass. *Assistant Secretaries*: MAURICE R. SCHARFF, 285 Madison Avenue, New York, N.Y.; GEORGE E. WALLIS, 1606 Hinman Avenue, Evanston, Ill.

• 1910 •

Carroll Benton has sent me a notice that the class members have again started their monthly luncheons on the third Tuesday of each month. These meetings were very popular prior to Al Phillips' death but lapsed until Carroll started them again on October 4. Present at this meeting were

Harold Arnold, Carroll Benton, Fred Dewey, Alfred Hague, Larry Hemmenway, Gordon Holbrook, John Lodge, Erford Potter, French Sargeant, Carroll Shaw and Howard Trueblood. It has not been definitely decided whether the meetings will be held at Whyte's or the Mining Engineers Club. Therefore, if anyone is in New York on the third Tuesday of the month and desires to attend the luncheon, telephone Carroll Benton at Exchange 3-9800, extension 2815, or call on him at the offices of the American Telephone and Telegraph Company at 195 Broadway.

The following is from the *Boston Post* of October 10: "That the Worcester Street Railway Company is facing a tough battle in its fight for increased rates on some lines is indicated in the fact that the city of Worcester has retained two consultants to assist in preparing the city's protest to the proposed fare increase. A hearing on the company's petition which asks for a 15-cent fare on certain routes is scheduled for Wednesday. To give engineering and accounting advice, Earl H. Barber, graduate of . . . Technology and associated as an adviser for 15 years with the Public Utilities Commission and its predecessor, the Gas and Light Commission, has been retained."

Frank Bell has written that he is now retired as brigadier general in the Reserves due to the new age limit. The following is from the *News Letter* of the office of the senior instructor, Officers Reserve Corps: "Brigadier General Frank F. Bell, Commanding General of the 310th Replacement Depot, Reserve, Dallas, has been retired from the Active Reserve to the Honorary Reserve, after reaching the statutory age of 60. The reserves lost a very active and efficient officer with the retirement of General Bell. It will prove difficult to replace him, both as a unit commander and a fellow officer. A biographical sketch on General Bell appeared in the August 1949 *News Letter*."

At the meeting of the Committee on Financing Development held on November 19 and 20, four of the 11 members of the Class on this committee were present at all the various programs: Harold Manson, Gordon Holbrook, Bob Burnett and your Secretary. We had a most pleasant time at the luncheons and the dinner and were deeply impressed with the new Development Program. — I called on Dan Gibbs in Lewiston, Me., during November. Dan is very busy designing buildings in Maine, looks the same as ever but has put on just a little more weight.

Louis O. French is still working on his fuel injection for Diesel engines as a hobby when not engaged in his profession of patent attorney. — I met Ralph Horne very recently. He is extremely busy in the design of airports, bridges and army bases. — HERBERT S. CLEVERDON, *Secretary*, 120 Tremont Street, Boston 8, Mass.

• 1911 •

We had a fine delegation of 14 classmates and wives at the Killian-Compton-Dandrow New York Testimonial Dinner at the Hotel Biltmore in early December, according to a fine report sent me by Class President Don Stevens, II. There were

Phil and Mrs. Caldwell, Jim and Mrs. Campbell, Livingston Ferris, Bob Haslam, Nat and Mrs. Seeley, D. R., and Mrs. Stevens, Ralph T., and Mrs. Walker and Walter and Mrs. Welch. Dick Gould and his wife had hoped to attend, but Dick is on a visiting committee at the Institute and was in Cambridge on that date.

Among the patrons of the gala affair, which was fully reported in the January Review, were Robert T., and Mrs. Haslam, D. R., and Mrs. Stevens, Ralph T., and Mrs. Walker and Rufus E. Zimmerman.

"As for other news," writes Don, "I have given lectures at the Newark, N.J., College of Engineering by request of the faculty to two separate, large sophomore class groups on the subject of 'Ethics In Industry.' I found that preparation for this subject was good for my soul. Some years ago I gave two lectures at M.I.T. to Erwin Schell's classes, but not on the subject of ethics. Did I tell you that Okonite [of which Don is vice-president] has opened a fourth plant, not for the manufacture of cables, but, believe it or not, for plating operations, particularly on non-conducting surfaces? We are having the usual 'birth pains.' Then too, I went to Pinehurst with three other friends in November for golf and recovery from the Truman election!"

Ye Secretary is planning to go to New York on January 10 through January 12 for the annual National Retail Dry Goods Association meeting at the Hotel Statler and the concurrent annual convention of the National Association of Retail Secretaries, so Don and three other classmates, Phil Caldwell, I, Dick Gould, XI, and Harry Tisdale, V, are planning a "luncheon for Dennie" at the M.I.T. Club of New York on Wednesday, January 12 at noon. With 54 up-to-date names on the New York 1911 roster, it is hoped to have a well-attended affair and a report of it will be included in the 1911 notes for the March Review.

We lost another fine classmate on November 8 in the death of Walt Hildebrand, I, at his home in Wilmette, Ill. "Dad had been ill for four years to a day," writes his younger son, Bob'45, "and because of his cerebral hemorrhage then, it was like losing him four years ago. Dad wrote on *The Tech* and was sports editor when he left school. He always loved to write and carried on his business mostly by mail. He started out as a salesman after he left Technology, starting in business for himself in 1913, and has been president of Walter H. Hildebrand and Company, 934 West North Avenue, Chicago 22, Ill., embroidery manufacturers. My older brother, Walter, Jr., '43, has taken over the business and is doing a fine job of it. Mom took everything better than expected. I'm married now and am working for Boeing Airplane Company here in Seattle, Wash. My wife and I are living at 5307 Henderson Street, Seattle, Wash." Those of us who remember Walt Hildebrand well can picture him vividly as a fine fellow, grand mixer and enthusiastic undergraduate. His son, Bob, also an active undergraduate whom I remember from freshman camp where he was an active participant, first as a freshman and in succeeding years as a counsellor, is surely a "chip off the old block."

General George Kenney, I, commanding Air University, Maxwell Field, Ala., wrote in early December: "At the next get-together of the 1911 crowd I wish you would extend my thanks and deep appreciation for the resolution they adopted at the dinner at Walker Memorial on November 8 [see 1911 class notes in January Review]. It was exceedingly flattering and down deep inside me I know that I am not that good, but I liked it just the same and if I've fooled people into liking me that much I hope they never get wise to me. I wish I could be there myself to thank the gang but as the chances are too slim to bank on, be a good guy and do it for me. Don't forget now! I got down here a couple of days before your letter arrived and am now looking the place and the job over to see what makes it tick and what I'll have to do to keep it ticking. It's a well-organized, smooth-running show; my associates are a carefully selected, smart, easy-to-get-along-with gang."

Over the long Thanksgiving week end, Sara and I spent the time with our two sons and their families in Cornish, Maine, and while there I read in the "Voice of the People" column of the *Portland Press Herald* on November 24 a letter titled "Farmers Have Rights," signed by Carleton W. Eaton, XIII, of Gray, Maine, a classmate from whom I have not heard in years. Reproducing it here, in part, will give us an insight into his point of view: "I reside and earn my living," Carl writes, "on a small farm of 75 acres in fields and woodlots in Gray. Every year, every day during November, guns are fired within my hearing all day long. I tie up my goats and my dog; my neighbors all tie their horses and cows tightly to their stalls; and we all try to get our firewood out of the woodlot and into the yard before November; then heave a sigh of relief when November, one of the prize months of the year, is over. Of the many hunters who have gone through my yard, some of them poking shells into their rifles before they were half across the lawn, some with guns already loaded straight off the highway, only one group ever asked my permission to hunt on my farm, and they got it. It seems as though men with guns have no consideration for the rights of others. They park cars in your driveways, regardless of inconveniences to the property owner, and farmers will soon be forced to post their land and forbid all hunting thereon, for the sake of their own lives as well as that of their livestock, to say nothing of their peace of mind. Then too, it would have been so diplomatic and nice of the commissioner if, in his advertising, he had added just a word advising his hunters of the fact that hunting on a man's farm is by permission or sufferance by the owner, and not a right that men with guns acquire with citizenship."

Three address changes have been received: Reuben Y. Althouse, I, Apartment 3B, 463 Boulevard, Hasbrouck Heights, N.J.; William D. Foster, IV, 307 South Lee Street, Alexandria, Va.; Lawrence B. Weeks, VI, brigadier general, U.S.A., 5704 York Lane, Bethesda, Md.

As of November 30, 1911 passed its \$2,800 quota in amount raised in Alumni Fund IX, standing fifth among the classes

with 107 per cent of quota. At that same point our 142 contributing classmates ties us for first place among all the classes with the Class of 1891; each at 117 per cent quota. 1911, there she stands! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Gardner, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford 55, Mass.

• 1912 •

Johnny Noyes, II, sent in the following interesting news and views from Dallas: "I note from the November issue of *The Review* that 1912 is toying with the idea of another reunion in 1949, and, although I lost out in 1947, I believe that Mrs. Noyes and I could quite definitely plan to attend a 1949 reunion. The 35th reunion is the only one that I missed and I am still regretting it. Don Radford gave me a working over when I was in Duluth last summer for not attending our 35th reunion and Harold Babbitt was through Dallas several weeks ago and put in his digs also. It certainly has been gratifying to receive so much interesting and up-to-the-minute news in the 1912 column of *The Review*; so whatever else transpired at Osterville in the summer of 1947, the results in *The Review* have been excellent. When the youngest of our six children went off to college at Middlebury, Vt., three years ago, we sold our big place in the country as it was a great deal to keep up, inside and out, but we have a very nice little cottage by the lake, with a guest room, so we can still take care of any classmates traveling through the southwest on their holiday trip to Mexico. I hope that this letter is not received too late to register my vote for a get-together in June."

As these notes are being written, the returns are coming in from the post card canvass. The score now stands at 12 who will probably attend if a reunion is held; 8 are in favor but probably would not be able to attend; 3 are uncertain; and 23 probably would not attend. We will try to let you know the results and conclusions in the next issue. The following comments were received on some of the cards. Henry H. Partridge, II, states that his business address is still the real estate department of the Firestone Tire and Rubber Company, Akron, Ohio, which handles all district, warehouse and store properties. Albert G. Gale, I, writes: "About five years more and we'll all be 65 years old and probably retired and could enjoy such reunions frequently." Harold A. Robinson, III, says that he is still assistant real estate officer of the South Atlantic division of the Corps of Engineers, stationed at Atlanta, Ga. James H. Morley, III, reports: "It is always nice to get together; hence, if many favor and will or can come, O.K. Busy as ever getting out Rutile. Deeply grieved that Charlie Locke '96 has left us." William Roy Glidden, I, writes: "I sure would like to see the 'boys' again after all these years. My son, Robert, is a rising young official of the International Harvester Company in Chicago. He has two lusty children, Mark, aged 6 and David, aged 4. I will complete a three year term on the board of directors of the American Society of Civil Engineers in January." Bartow V. Reeves, X, is still with the New Jersey Zinc Company, at Palmer-

ton, Pa. William A. Rhodes, VI, states: "I haven't been able to attend any reunions so far and there is no indication of a change in luck yet. But the more of them that are held, the more likely I am to get to one."

The New York *Herald-Tribune* reported that F. J. Shepard, Jr., was re-elected president of the Electrical Industrial Truck Association. — We regret to record the passing of Albert L. Pashek, VI, on October 26, 1948, at Lakewood, Ohio. We have also just received word of the death of Bertram S. Fenner, IV, in 1946. — From Albion R. Davis, Class Agent, comes word that "our Class is now in the first ten of all classes contributing to the Alumni Fund. There are still a great many fellows who never contribute at all. A few of these would put us right near the top. My emphasis is always on the number contributing, rather than the amounts." Good work, Albion. — FREDERICK J. SHEPARD, JR., *Secretary*, 31 Chestnut Street, Boston, Mass. LESTER M. WHITE, *Assistant Secretary*, 4520 Lewiston Road, Niagara Falls, N.Y.

• 1914 •

There were two interesting meetings of classmates during November. The first, however, was in connection with the Institute's Development Program. There was a large conference in Cambridge on November 19 and 20, at which a sizable overall committee was told about the Institute's requirements and the plans for carrying them out. Part of this will be done directly and part will be through the Alumni Fund. In fact, this was the basic purpose for which the Alumni Fund was started. At these meetings in Cambridge, your Secretary noted that Atwood, Blakeley, L. S. Hall, Hamilton, Kerr, Morrill, Peaslee, and Tallman were present. We had a chance to get together as classmates as well during these conferences. In addition to this group, the following are also serving on the large general committee: Bristow, Dinsmore, Douglas, Fiske, Garza-Sada, Goeth, H. H. Hall, Keith, Snow, Sutherland, Whitwell.

The second meeting was in New York on November 30, the occasion being one of Charlie Fiske's annual New York dinners for the Class. The meeting was held at the Yale Club, and there was a great deal of enthusiasm for the coming 35th reunion. Be sure this date, June 17 through 19, is on your calendar. Alden Waitt came up from Washington for the dinner, as did George Whitwell from Philadelphia. Norman MacLeod had expected to attend, but found at the last moment he had a conflict with a National Association of Manufacturers directors' meeting. Affel and Ober, who are usually regular attendants, had conflicts which prevented them from coming. In addition to Charlie Fiske, your Secretary, and the two persons already mentioned, there were present: Calver, Dickson, Faunce, O. C. Hall, Isaacs, MacCart, Mayo, Mudge, Owen, Peaslee, Perley, Richey.

The general plans for the reunion are getting pretty well under way. By the time you read this, you should have already received the class directory that is now being

prepared for distribution. This directory should be very useful in writing other classmates to inquire about their attendance at the reunion and in arranging for roommates. — As Harold Danforth has been in the New York area, he received a notice of the New York dinner. He wrote back, however, saying that last May he was transferred by the International Telephone and Telegraph Company to Rio de Janeiro, Brazil, as a staff divisional engineer. He thinks the distance is going to be a little too great to permit him to attend the reunion. — H. B. RICHMOND, *Secretary*, 275 Massachusetts Avenue, Cambridge 39, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York 19, N.Y.

• 1915 •

We are still \$422, and 14 contributors behind our score at this same time last year. With prompt contributions, these few remaining classmates, who have always donated, can put 1915 over the top again.

Good Jerry Coldwell writes this fine letter with the impressive menu and program from the testimonial dinner to Jim Killian'26, Dr. Compton and George Dandrow'22 at the Hotel Biltmore in New York on December 7. Classmates attending were: Jerry Coldwell, Hank Marion, Henry Leeb, Bridge Casselman, Ken King, Warren Cowles, Ben Lassen, Charlie and Mrs. Williams, Fred Cook and Tower Piza; a fine representation from our Class. Jerry's address is 8 Brooklands, Bronxville 8, N.Y. "Thought you might be interested in the enclosed menu from the dinner last Tuesday. I had the members at our table sign the fly leaf so you could check up on the classmates who were there. Of course, you will recognize the messy scribble at the bottom as being Tower Piza's and the copper plate script at the top as being mine. I hadn't seen Ken King and Casselman since we graduated so the meeting was particularly interesting. Ken King, McDaniel'17, Weare Howlett and I whiled away many an hour at bridge; the four of us were on the musical clubs together for all four years of our stay at Technology. So far as I am concerned the world goes merrily on. I do less traveling now, for which I am thankful. I get to the coast two or three times a year, to the Houston area several times and to Chicago many times. Compared with the old days, that amounts practically to staying at home. I went out to Chicago and then to our Monroe, La., office which is the headquarters of our construction subsidiary. There was a Christmas party down there on December 18. I flew back on the 19th and was home that night. We have a couple of planes of our own now, twin-motored Beech-crafts, so they handle the short hops from small towns to the airports where I can pick up the regular passenger planes."

In December, Ralph D. Waterman was made a vice-president of E. B. Badger and Sons Company of Boston. He has been with the company for nine years and is in charge of engineering and construction. Since seeing him at Sea Island, Ga., two years ago, Weare Howlett has been working on Ralph to join the Class at dinners

and reunions. Hank Marion was elected a vice-president of the Phelps Dodge Copper Products Corporation in New York City. Our congratulations to these two classmates on achieving such distinctive promotions. — A sad and heavy note ends our news this month. The passing of Kebe Toabe on December 7 leaves an absence hard to fill. Always a regular and generous contributor to the Alumni Fund and supporter of Class Dues, he took an active interest in all Institute and 1915 affairs and attended every 5-year reunion we have had. We'll miss a classmate like Kebe. He died at the Adelphi Hospital, Brooklyn. He was president of the Elizabeth Plate Class Company in New Jersey. He was vice-president of the Elizabeth Lions Club and formerly a director of the M.I.T. Club of Northern New Jersey. The sympathy of our Class goes out to his widow and two sons. — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline 46, Mass.

• 1916 •

We regretfully inform the Class of the death of Frank S. Hunt of Northboro, who passed away on November 20. Frank had been associated with the Maico Hearing Aid Company of Worcester. The Class extends its heartfelt sympathy to the family.

On the whole, our incoming mail from outlying provinces inhabited by the genus of men known as Sixteeners has been the most encouraging of recent months. If only it keeps up this way! Now that you have all found how easy it is to write, don't rest on your laurels and forget us. You can never write too often or too much. First on the agenda is a report of the M.I.T. Club of New York, Hotel Biltmore. December 7, turnout for the testimonial dinner to our new President, James R. Killian, Jr.'26 and to Karl T. Compton and C. George Dandrow'22, President of the Alumni Association. It was the largest affair of several years. Our Class was well represented. A nose count, which we hope was complete, included: Joe and Mrs. Barker, Dick Berger, Walt and Mrs. Binger, Arthur and Mrs. Caldwell, Harold Dodge, Jim Evans, Bill Farthing, Dutch Gaus, Ping and Mrs. Loo, Al Pettee, and Len and Mrs. Stone. We missed Steve Brophy and Earl Mellen, both of whom were, unfortunately, hospitalized. It is a rare event when Steve is absent from one of these main New York events. Dr. Compton summed up the history and growth of the Institute and pointed with pride to its position of continued pre-eminence in the engineering and scientific world. We were very glad to hear that Dr. Compton is to continue with top activity in Institute affairs as chairman of the Corporation.

Ping Loo, present at most Technology activities in the New York area of late, finally got around to replying to our quest for news. "In Europe," he said, offering an excuse. We accept it. Ping then lists an even dozen of his past jobs since graduation. They include everything from work at the Winchester Repeating Arms Company in New Haven from 1916 to 1918, through being manager, engineering de-

partment, American Machinery and Export Company, Tientsin, China, a member of a demolition crew with the Chinese National Army, up to being on leave at present. Well deserved, too. His road has been a hard one and we would like to quote a good bit from his letter: "On September 18, 1931, the Japs invaded Manchuria and wiped me clean. I was left with nothing but credit. M.I.T. fighting spirit brought me up again, this time shifting from North to Central and South China. Then came August 13, 1937! Mr. Jap 'favored' us with another 'visit.' Barely escaped with the family. Got real mad this time and changed from construction to destruction. After V-J Day, I, like all other Chinese, thought we would be able to settle down and dig in for some good constructive work again. Disappointed and disillusioned. Reason? It is in all your newspapers and radio broadcasts. Discouraged? No! An M.I.T. graduate never gets discouraged. Married the girl whom I first met in Washington in 1910, then forgot all about until we met again in the spring of 1919 and I fell hard. Have three children, two daughters and a son, and two grandchildren, both boys. All have had American college educations. We all live at present in and around New York and could be a very happy family if we didn't have to worry about conditions at home."

We are more than pleased with a long letter from Bill Kniesner but please note we are printing all of it under coercion. The post script on Bill's letter will tell you why we are forced to avoid editing in this particular case. Bill writes: "Thanks for your recent letter. It is said that genius is the capacity for taking infinite pains; the Class of '16 has a couple of Genii for secretaries as is so attested to by the interesting and consistently voluminous class news they succeed in digging up. For their infinite pains in so doing, Oscars to them seem clearly to be in order and I herewith make recommendation to the Class that at an appropriate time and place suitable award and recognition be made. I think it quite insufficient that their constructive contributions be recorded in printers' ink only. Your barrage of inquiries, true to your perseverance, came over a period of time when the household was in the throes of migrating to Worcester, Mass., and trying to get settled down there; for a couple of years or so ago I joined the legal department of Norton Company titulary as general counsel, and I have since been much absorbed in the burdens of so pleasant an association with such an unusual and progressive organization as is Norton Company. Though that sounds like complete desertion of my former partners at 155 East 44th Street, New York, I continue, but obviously in much curtailed degree, my association with them. At home we find living pivoting pretty much about our teen-age son and daughter and that, at their ages, I guess is pretty much as it should be. Both look forward to summers spent on the Maine seacoast where, largely under the tutelage of their uncle, Carl D. Lane, they have developed into quite competent sailors and seamen. Mr. Lane you may recognize as the author of that nautical best

seller, *The Boatman's Manual* and also *How to Sail*; no yachtsman ought to be without the former and no beginner without the latter (how's that for a commercial plug?). The family navy was some time ago increased by the addition of a cabin cruiser and in the latter category the 'old man' gets a break at such times as he himself can get to Maine during the summer. With such dogged perseverance as is yours, now that I have given you the above thumbnail sketch, one is led to wonder whether insatiability is also an element of those infinite pains. Such valiant efforts as you are making are worthy of support and let it not be said that I let you down. Keep up the good work. P.S. If you let the above go to press, with those parts cut out that commend the two secretaries for their splendid work, rest assured that you will never again get a reply from me when you again ask for help." Now you see.

Dave Patten surely gets around. We noted in an early issue of *The Review* that he is with the Economic Co-operation Administration mission in Lisbon. He writes: "Your letter has reached me at this far away spot. My secretary hasn't arrived yet, so forgive this longhand. I'm here as minister in charge, Economic Co-operation Administration, which puts the Marshall Plan into effect. My activities prior to this adventure, since retirement to inactive duty from the Navy in May, 1946, were devoted to personal affairs. I remarried in the fall of 1945, my first wife having passed away 3 years earlier. The new Mrs. Patten is a Californian, widow of the late General C. W. Russell, Army Air Corps. With this good fortune are, additionally, three fine stepsons, all of whom participated in the War. We are now proud grandparents of the first offspring of the oldest who is married to Mrs. Angelica Lloyd MacDonald, daughter of Demarest Lloyd of Boston and Washington, D.C. So far the details of the Economic Co-operation Administration consist of the trip via the *Queen Mary*, a week in Paris at general headquarters of Ambassador Harriman, and then the motor trip through southern France, Spain, and Portugal, where we arrived November 1. Lisbon at first glance has many charms, and once settled we hope to become more familiar with this ancient seaport."

Hy Ullian writes us on letterhead that says "New England Survey Service Inc., Civil and Consulting Engineers, Boston, representing Fairchild Aerial Surveys, Inc." He says: "During the past 25 years I have been directing my own civil engineering firm. In World War I, I was in the Navy. In World War II, my services seemed to be more needed in the engineering field. Our company assisted the United States Army Engineers in planning and laying out air fields and gun emplacements. After the War, we analyzed and prepared brochures to assist in the sale of thousands of war plants. We have also been working with the Federal Housing Authority in several of their projects and have been active in reappraising properties for municipalities for tax purposes. Last summer the three of us (wife, son, and I) toured Europe to understand better the problems that face us all. I am looking

forward to our next reunion in 1951 and am curious as to whether I shall still be able to hold my place on the baseball field."

Ed Williams brings us nicely up to date on his current welfare. Ed says: "Immediately following graduation I went with the Associated Factory Mutual Fire Insurance Companies in their inspection department, and with the exception of some time in the Air Corps in World War I, and a couple of years in manufacturing in the Middle West, I have been associated with them ever since; for the past 10 years as president of the Cotton and Woolen Manufacturers Mutual Insurance Company of New England. In this work I am pleasantly associated with our classmate, Hovey T. Freeman, and my dearest competitor is Frank Ross, Executive Vice-president of the Factory Insurance Association. I have one son who graduated from the Institute in 1947, having sandwiched in almost three years in the Infantry in World War II. Last summer I gave up suburban life and bought a small house on Beacon Hill. Although I am in no way a Proper Bostonian, I am finding it a pleasant life and am looking forward to deep snow this winter which I will not have to shovel. I enjoy summers on Cape Cod, and a bit of cruising and fishing. I am looking forward to joining you at our 35th reunion."

If we remember correctly, we hadn't heard from Paul Hatch for a long time, but he came across nicely recently with the following: "My engineering work goes along about the same from day to day. Interesting, but exacting. There seems to be a great deal of construction work coming along and Stone and Webster are getting their share. I am pretty well tied up at present with the New Turbine Building for the General Electric Company. This is really a mammoth building and will be a remarkable plant when it is done. I recently had occasion to go to Syracuse on business and while there spent a few hours and had dinner with Harold Gray. He is in the business of making 'lost wax' castings and has a very nice setup. E. H. Barry, also of Stone and Webster, has just returned from a five-weeks' trip to Turkey to survey their power resources."

On November 23 in Morss Hall, Walker Memorial, Bob Wilson gave the 1948 Arthur Dehon Little Memorial Lecture, using as his subject, "Research on a Single Reaction and Its Social Effects." Shatswell Ober has sent a little brochure that was distributed on the occasion stating, "A few local 1916 members and Harold Gray from Syracuse were present. The local talent I saw there included only Tom Berrigan and Joe Minevitch. Not much moral support, perhaps, but Bob doesn't need it." There was an impressive biography of Bob Wilson in the brochure, which we reproduce in abbreviated form herewith: "Chairman of the Board, Standard Oil Company of Indiana, the first chemist, the first industrialist, and the first alumnus of the Institute to deliver an Arthur Dehon Little Memorial Lecture. After a brief career in the Chemical Warfare Service, he returned at the end of World War I to become Associate Professor of Chemical Engineering and Director

of the Research Laboratory of Applied Chemistry here. In 1922 he was appointed Assistant Director of Research for his present company. His achievements include pioneering work in the application of chemical engineering principles to the petroleum industry and in particular to methods of oil refining. For these he received the Perkin Medal in 1943. Vitally interested in the patent system, he has been a vigorous critic of some of its details. In World War II he held a number of top posts in various national production councils; later, at the request of the Treasury Department, he became one of the four managing directors of General Aniline and Film Corporation, taken over from German ownership. He is a Life Member of the Institute's Corporation."

A news clipping from the *Providence Journal* informs us that one Lauriston E. Knowlton has been made executive vice-president of the Providence Gas Company. He entered the employ of the company in 1919 after serving as a captain in World War I. He has served in a number of offices in the company over the past 29 years, and we know that the honor of his new position is well deserved. Congratulations from all of us, Larry. — Bill Farthing, our eminent Class President, has recently corresponded with your Secretary. We asked him to go on a little hunting jaunt with us during the current season, but received a note with the surprising information that he had just returned from a rather successful hunting trip on his own in Old Mexico. We hope that President Farthing will favor us with all the details for the next issue.

We talked to Dina Coleman on the telephone the other day. He drove up from Virginia to visit his daughter at Wellesley, and he and Rusty White and Steve Whitney had what is rumored to be a very successful private reunion. Your Secretary was invited to attend, but previous commitments prevented. — Thanks for the response to our requests for news. You can see from this column what a pleasure it is to read about our long lost friends and classmates. Now, it's your turn to send in that letter. — RALPH A. FLETCHER, Secretary, Post Office Box 71, West Chelmsford, Mass. HAROLD F. DODGE, Assistant Secretary, 463 West Street, New York 14, N.Y.

• 1917 •

The news of most interest to us all, of course, concerns the status of the 50th reunion glass gift, which certainly seems to be off to an excellent start. Walter Beadle is chairman. We trust that the new reply cards sent out to those who have not yet responded to the plan will be on their way to headquarters by now, and all of them with yes's. It will mean a great deal, come 1967 and the 50th reunion, to be able to provide a class gift which will be of definite assistance to the Institute.

We see by the papers that we have a fast flying member of the Class of 1917. Arthur Knight of Scranton, Pa., recently flew from Scranton to Hyannis in one hour and 35 minutes. Art was his own pilot. — Stan Dunning writes that he has been back in Cambridge and is a manufacturers' representative, thus satisfying

an "old yen to be on my own. It is my good fortune to be associated with an old friend who is well established and I have now been digging in for six months. My activities are in New England selling housewares to the wholesale trade, principally. It certainly is very much of a change but things have gone better than I had dared hope and I have the satisfaction of being home instead of being a visitor there. The report of the class members in regard to the class gift is fine. I've taken in little of local activities and seen few of the old crowd, because I've been so blamed busy, but I'll catch up with this."

Bill Mehaffey has been spending most of his time in Harrisburg, Pa., since August last year, doing work for a consulting engineer firm. He has recovered from his recent illness so that he can be up and about again, but still watches his step pretty carefully. — The body of Thomas F. O'Brien, captain, U.S.N., who died in a Japanese prison camp in 1942, was brought back to this country in November. Services were held in Dorchester, Mass., on November 4, and burial was in St. Joseph's Cemetery in Gardiner, Maine. — There was a brief note in the November, 1948, notes about the housing development in the Boston area which is being sponsored by the John Hancock Insurance Company; the project being managed and directed for the company by Lucius Tuttle Hill. *Business Week* of October 9, 1948, carried an article (page 25) on the project, which we found of interest. The building has gone on in spite of higher construction costs and material shortages. More than 10,000 families applied for the 800 units; and there is talk of a similar development being put through in Michigan. Word reaches us that Loosh has not been well. — **RAYMOND STEVENS**, *Secretary*, 30 Memorial Drive, Cambridge 42, Mass. **FREDERICK BERNARD**, *Assistant Secretary*, 24 Federal Street, Boston, Mass.

• 1918 •

These winter evenings when we stretch out our hands to the hearth and reflect on values which are no less real because we cannot touch them, are times for just such bits as the following: First comes Bill Wills, that perennial old builder on the theory that a man's castle is his colonial type house. Writing in the Fall River, Mass., *Herald News* Bill reflects: "When I was a teenager, I had the constant urge to make things. My work showed creative imagination and inventiveness, but did not indicate I would ever be an accomplished mechanic. As a result, I was early tagged as a prospective candidate of . . . Technology. I indulged in plenty of outdoor sports, but wanted to be a cartoonist and would copy Mutt and Jeff and Happy Hooligan for hours. Later I created comic strips, kid strips and the like. I never became a cartoonist, although I carried this avocation all through M.I.T., illustrating the funny pages of *Technique*. I also did cartoons for several papers and magazines after graduation, and illustrated some of my own books.

"The point I wish to make is, though cartooning was always a sideline, I was

able to use it with every job I held, for making a point, illustrating an idea, or obtaining attention. In the field of cartooning my work would probably have been considered ordinary; but in architecture or engineering it was considered highly amusing. The hours I spent making cartoons proved of great help to me later when it came to rendering and drawing. It all led to my specializing in house architecture. I know I have done better in it than I could have done in any other field. The reason is that, as a teenager, I liked to create and to draw, and when a person does the thing he likes and really works at it, he will get satisfactory results." Translated into the analytical reflections of a philosopher, what that means is that to try to do what someone else wants you to do for a living is to destroy yourself. You become only someone else's fantasy. You lose yourself. You just don't exist any more. Or do you?

While Bill contemplates results, Henry Lacey can contemplate the future, for as these notes are being written Henry is about to take up his assignment as Base development officer of the Marianas Islands, having completed a tour of duty as public works officer of the 3d Naval District. Thus do two World Wars, Guam, the Canal Zone, Pearl Harbor, and New York lead to four stripes in the navy reflections about ships and seas and sealing wax. Sam Chamberlain (not Sam the architect who ended up as a photographer and etcher, but Sam the mechanical engineer who ended up manufacturing tailored lace curtains in Plymouth) is also aboard ship. His reflections as he cruises to Cuba and to South America are on son Malcolm, who graduated from Bowdoin College in 1947, and who has a strangle hold on a doctorate in Chemistry somewhere in Building Eight.

The contented expressions on the Howard twins, Paul and Alan, as they bask beside the hickory logs in their respective fireplaces are traceable to their inclusion in that gallery of men of achievement Professor Schell has established in Building One. "President of a Company" appears under each portrait and the suggestion that the lords of the coffers reach their admirable success as a clear consequence of exposure to certain classrooms not far away is inescapably imprinted on the undergraduate mind. When the same thing happens to identical twins in different environments the only explanation is, of course, the effect of their similar educations. Selah.

As for the reflections in the minds of the boys at the Testimonial Dinner for Dr. Compton held in December in New York, it can be said that all of them regret his resignation as president. Alan Sanger and his wife were there, as were Tom Brosnahan, Phil Dinkins, Ned Longley, Harold Sturtevant, Marvin and Mrs. Pierce, Sax and Mrs. Fletcher and — **GRETCHEN A. PALMER**, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

• 1919 •

Plans are under way for our 30-year reunion. Will Langille is chairman of the committee to handle all arrangements.

Paul Sheeline will be chairman of the Boston group. The reunion will be held in Connecticut at some halfway point between Boston and New York and later announcements will give further details, although the preliminary plans are to have it toward the end of July as we did five years ago. This reunion will be held starting with a Friday dinner through a Sunday luncheon. It will be a stag party. Mixed luncheons will be held in both Boston and New York on Friday noon preceding the reunion proper. We are expecting a big turnout this year since the war restrictions of five years ago should hamper none of us and the early replies from your secretaries' cards indicate considerable interest. Kindly send any suggestions in to your Secretary or to Will Langille. — The M.I.T. Club of New York Testimonial Dinner on December 7 at the Hotel Biltmore was attended by Don Way, Jim Strobidge, Jacob Braverman, Will Langille and Mrs. Langille, and Dusty Rhodes.

We have just received notice from the Chambers Corporation, Shelbyville, Ind., that John L. Karmire died in December, 1943. — Richard Holmgren, San Diego, Calif., writes that he is still assistant chief engineer of the San Diego County Water Authority. He writes: "Have just completed new home 14 miles east of San Diego on Mount Helix. Will be pleased to put up any class members traveling this way to visit and enjoy the 'Harbor of the Sun' (See Max Miller, author). I doubt I can make the reunion. Hope to visit Mexico City in the spring." S. Albert Kaufman, North Wilmington, Mass., says he will attend the 30th reunion. He is a land surveyor and was installed senior warden of Germania Lodge, Ancient Free and Accepted Masons at the annual meeting in September, 1948.

Leslie A. Jackson of Little Rock, Ark., dropped a line to say that he is still at the same job. Rogers B. Johnson writes to say that he hopes to attend the reunion. He is New England institutional manager for the U.S. Hoffman Machinery Corporation. They manufacture laundry machinery for hospitals, colleges and other institutions. His son, Rogers B., Jr., is a senior at Harvard and is on the swimming team. — Arthur S. Johnson has just been made vice-president of the American Mutual Liability Insurance Company. He is also manager of the engineering department. The *Boston Post*, of November 20 made this announcement: "Mr. Johnson joined the American Mutual in 1923 as a safety engineer, after five years with the Newport News Ship Building and Dry Dock Company, Newport News, Va. In 1929 he was appointed assistant to the manager, engineering department, and in 1941 was elected assistant vice president. An M.I.T. graduate in electro-chemical engineering, Mr. Johnson is a member of American Society of Safety Engineers; American Public Health Association, and represents the National Association of Mutual Casualty Companies on the Standards Council, American Standards Association. He has been actively connected with national, State and local safety programs, both industrial and highway."

Tim Shea has moved from Chicago, Ill.,

to 245 Springfield Avenue, Rutherford, N.J., while Henry E. Wilson, a captain, U.S.N., has moved from Palo Alto, Calif., to 495 Summer Street, Boston 10. — Plan your summer vacation to spend one week end toward the end of July at the 30th reunion with the Class. — EUGENE R. SMOLEY, *Secretary*, The Lummus Company, 420 Lexington Avenue, New York, N.Y. ALAN G. RICHARDS, *Assistant Secretary*, Dewey and Almy Chemical Company, 62 Whittemore Avenue, Cambridge 40, Mass.

• 1920 •

Franklin Badger is spending the winter in a balmy climate. He may be reached at Box 121, Hollywood, Fla., and he won't be back up north until April. Eric Etherington is now living in Ridgewood, N.J., at 81 Godwin Avenue. Rolland W. Case, brigadier general, U.S.A., has moved from Arlington, Va., to 3901 Connecticut Avenue, Washington, D.C. Your Secretary had an exceedingly pleasant visit with George Dandrow²² and Mrs. Dandrow recently. Even though George is officially affiliated with the Class of 1922, he has so many associations with our Class and friends in it that it is a pleasure to report that the President of the Alumni Association is as hale and hearty as ever and that his additional responsibilities are being taken in stride as one would expect. Your Secretary also had the pleasure of seeing Ed Farrow at the December meeting of the M.I.T. Corporation.

Those of you who have not visited the Institute in recent years ought to make serious plans to do so. You could not fail to be impressed with the changes and expansions that have taken place and you would take away with you a feeling of renewed pride in the accomplishments of your Alma Mater and a renewed appreciation of its significance in the world of science and engineering. Here's hoping that many of you will find it possible to make a pilgrimage to the Institute in the near future. There are big things going on there and we should all know about them and be a part of them. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

• 1921 •

The admission of six sons of 1921 as members of the Institute's Class of 1952 maintains the Second Generation Club at the same number as last year. The group also includes three seniors, five juniors and five sophomores, listed below with Dad's name in parenthesis: Seniors: John W. Barriger, 4th, (John W. Barriger, 3d.), Gary S. Colton (H. Seymour Colton), Malcolm H. Kurth (Henry R. Kurth). Juniors: Frederick W. Adams, Jr. (Frederick W. Adams), John E. Bent (Roderic L. Bent¹⁹), Herbert C. DeStaebler, Jr. (Herbert C. DeStaebler), William B. McGorum, Jr. (William B. McGorum), Stephen H. Senzer (Sidney Senzer). Sophomores: Noel T. Adams (Frederick W. Adams), John M. Lee (John G. Lee), Francis B. McKee (Andrew I. McKee), Wilfred H. St. Laurent, Jr., (nephew of Raymond A. St. Laurent), Thomas A.

Thornton (Charles E. Thornton). Freshmen: William C. Church (Walter E. Church), Richard F. Jenney (Melvin R. Jenney), Robert M. Lurie (Joseph Lurie), John B. Mattson, Jr. (John B. Mattson), Arthur H. Schein (Summer Schein), Paul G. Wetherbee (George B. Wetherbee).

We are indebted to Jack Rule for the new names on this list and will welcome any later additions. Jack, who heads the section of Graphics at the Institute, has been busy on the M.I.T. Development Program and as our representative on the War Memorial Committee of the Alumni Association. — Irv Jakobson wins the award of the year for his help and courtesy in sending three letters in the past month. The President and General Manager of the Jakobson Shipyard, Inc., Oyster Bay, N.Y., came across with the first secretarial committee news and followed it up with two supplements. Jake made special arrangements for attendance of the Class at the alumni dinner of the M.I.T. Club of New York in December, honoring Karl T. Compton, Jim Killian²⁶ and George Dandrow²². Among those present were: Frederick W. Adams, Anthony and Mrs. Anable, Christopher C. Carven, Louis Mandel, J. Van Horn and Mrs. Whipple, Edward M. Craig, Jr., Lawrence B. Richardson. Jake adds: "Sandy McMoran and his wife drove down from Buxford, Mass., to spend a week end with my wife and me during November. I attended a meeting of the M.I.T. Committee for Financing Development in Cambridge and saw a number of 1921 men there during the interesting two-day session. We have a big job to do and I hope that the members of the Class will respond with understanding and generosity when they are approached by the Committee."

Wint Dean, Honorary Secretary of the Institute for St. Paul, sent a holiday note on his return from a vacation trip to La Jolla, Calif. — Bill Loesch, President of the M.I.T. Alumni Association of Cleveland, reports that Ilsley Bradley, Seymour Colton, Joe Gartland and Bob He attended the November meeting. R. J. Roy missed the party due to illness. Bill says he hasn't heard from Harry Junod²³. Raphael Van Neste is a new resident of Cambridge, where he is associated with the Reconstruction Finance Corporation.

Dugie Jackson, Jr., reports a move from Cambridge to Darlington, Md. Linc Barker, metallurgist with General Electric, Schenectady, also has a new mail address, Rural Delivery Number 1, Ballston Lake, N.Y. L. George Horowitz, formerly a lieutenant colonel, is back in civilian life and is residing at the Hotel Carlyle, New York City. Archie Mock, long time resident of Long Beach, Calif., is now in San Francisco, where his new address is 55 West Clay Park.

No doubt all of you have read details of the extensive long-range development and financing program which was the subject of the two-day meeting of some 300 Alumni in Cambridge in November. Forty members of the Class are included in the Committee for Financing Development, 11 of whom were present at the fall meeting.

The 1921 representation includes: Fred-

erick W. Adams, Anthony Anable, Paul N. Anderson, Oliver L. Bardes, John W. Barriger, 3d, Carole A. Clarke, Stewart P. Coleman, C. Levon Eksergian, Harry P. Field, Simon W. Freese, William R. Hainsworth, Flemmon P. Hall, Alexander D. Harvey, Charles H. Herty, Jr., Irving D. Jakobson, Jackson W. Kendall, Dana E. Kepner, Ivan C. Lawrence, Willard G. Loesch, Howard F. MacMillin, A. Warren Norton, Irving K. Peck, Donald W. Randolph, Lawrence B. Richardson, Eugene W. Rudow, John T. Rule, Raymond A. St. Laurent, Joseph J. Schaefer, Alfred J. Shaughnessy, William J. Sherry, Saul M. Silverstein, George W. Spaulding, Glenn Stanton, William M. Stratford, Lyall L. Stuart, Albert H. Wechsler, Eugene S. Weil, Richard P. Windisch, A. Royal Wood, David O. Woodbury.

A note from you would be most welcome right now. — CAROLE A. CLARKE, *Secretary*, International Standard Electric Corporation, 67 Broad Street, New York 4, N.Y.

• 1922 •

George Dandrow, along with Dr. Killian²⁶ and Dr. Compton, was one of the guests of honor at the annual M.I.T. Club of New York dinner held on December 7 at the Hotel Biltmore. Sam Reynolds, President of the Club, presided and had the pleasure of introducing Larry Davis as toastmaster. The Class, as usual, had a fine turnout. Those present were: Irving Ball, Charles Burke, Malcolm S. Burroughs²⁰, Paul J. Choquette, Laurence B. Davis, A. J. Frappier, H. C. Gayley, Joseph Givner, C. D. Grover, Broderick Haskell, John F. Hennessy, L. F. Hickernell, F. M. Kurtz, P. T. Lamont, F. S. Lincoln, R. G. MacDonald, Malcolm S. McGhie, Milton M. Manshel, David M. Minton, Jr., William H. Mueser, A. P. Munning, H. Judd Payne, Paul M. Phillips, W. D. Pinkham, S. H. Reynolds, Frank O. Rickers, Theodore Riegel, Raymond C. Rundlett, Paul Ryan, H. M. Shirey, Dale D. Spoor, Sydney M. Strauss, John H. Teeter, E. V. Van Pelt, Jr., Everett W. Vilett.

Our hearty congratulations to Don Carpenter on his election to life membership on the Corporation. A full account of this appeared in the December, 1948, Review. Now that Don is one of Drew Pearson's favorite targets, his name is practically a household word. — Burton G. Robbins, who left Technology and engineering for the ministry, is now pastor of the Methodist Church in Exeter, N.H.

New addresses: Leonard P. Botting, 47 Roosevelt Avenue, Westwood, N.J.; Frederick J. Burt, 124 Sagamore Road, Maplewood, N.J.; Charles C. Fulton, 147-49D Charter Road, Parkway Village, Jamaica 2, N.Y.; Charles B. Miller, Jr., Carolina Apartment, Pilot View and Carolina Avenue, Winston-Salem, N.C. — Children's school addresses: Bob Brown's daughter, Barbara, is a junior at Simmons College in Boston where she lives at East House. Your Secretary's older son, C. Y. C., Jr., is a first classman at the United States Coast Guard Academy, New London, Conn., where he is due to get his B.S. and commission next June. — C. YARDLEY CHIT-

TICK, Secretary, 77 Franklin Street, Boston 10, Mass. WHITWORTH FERGUSON, Assistant Secretary, 333 Ellicott Street, Buffalo 3, N.Y.

• 1923 •

The report of the 25th reunion has been held up by a number of factors, the principal ones being that your Secretary has been away from his office an unusually large part of the time this fall and hasn't been able to keep after the printer on it, and that printers, like everybody else, have so many days off that work doesn't go through the shop as fast as it used to. However, as this is written there is every expectation that the report will be in your hands by the time these notes appear. We think you'll like the report and hope it will be of interest both to those who were present and to those who were not.

Directors of Reo Motors, Inc., of Lansing, Mich., in November elected Joseph S. Sherer, Jr., president and general manager of the company. Sherer attended the United States Naval Academy as well as the Institute and joined Reo in 1943. — H. H. Zornig, who has been with the General Electric Company, at Richland, Wash., is now located with the company at Schenectady. — Alfred M. Perkins has a hobby he calls rockhounding and has written about some aspects of it in the *Lapidary Journal*. He has a few reprints of the article which he says he will be able to furnish while they last for 50 cents each to others interested in the subject. His address is Casa de las Cruces, Las Cruces, New Mexico. — HORATIO L. BOND, Secretary, National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. HOWARD F. RUSSELL, Assistant Secretary, Improved Risk Mutuals, 60 John Street, New York 7, N.Y.

• 1924 •

A large number of the Class attended the meetings held in Cambridge and Boston on November 19 and 20 to inaugurate the new M.I.T. Development Program. Among those who sat at the class tables at the Hotel Statler were Paul Cardinal, Roger Cutting, Nate Schooler, Cy Duevel, Mike Amezaga, Tony Rosado, Chick Kane, Harold Hazen, Blay Atherton, Art Merewether '25, Pret Littlefield, Joe Mares, Kitty Kattwinkel '23, Tom Sherwood, George Knight, Andy Kellogg, Joe Naughton and your Secretary, who may have missed a few names of classmates who were there.

The meeting provided an opportunity to catch up on the news of many who have been missing from these columns for many years. Mike Amezaga and Tony Rosado had flown in from Cuba, where the former is the island distributor for International Westinghouse and also operates three other companies, and the latter is vice-president of the Cuban Telephone Company with which he has also served in Spain and other parts of Europe.

Art Merewether, remembered from bygone years as pilot of the Institute's first weather plane, was a colonel and chief meteorologist in the Army during the War, and is now at La Guardia Field doing

similar work for American Airlines. Joe Mares is back at rebuilt Texas City with Monsanto. Dr. Kattwinkel is practicing medicine in Boston, and Andy Kellogg is general manager of Schenectady's leading newspaper. Littlefield is treasurer of Canada Dry. Paul Cardinal is making a large part of our vitamins. Nate Schooler produces indispensable partitions for New York office buildings. George Knight heads the Elliott Addressing Machine Company in Cambridge. Harold Hazen heads Course VI (D. C. Jackson in our day), and Tom Sherwood, who was one of the conference speakers, is dean of engineering. With Cy Duevel making thermos bottles and Blay Atherton mixing insurance with New Hampshire politics, it was about as diversified a group as could be found.

From the newspapers we learn that Hayden Kline has been elected president of Industrial Rayon Corporation; that Paul Hedenstad has been appointed superintendent of the Bureau of Sewers in Worcester, Mass.; and that Tom Rhea of General Electric's industrial engineering department at Schenectady is the holder of several patents, most of them concerned with applications of electrical equipment to steel mills. — FRANCIS A. BARRETT, General Secretary, 234 Washington Street, Providence, R.I. WILLIAM W. QUARLES, Assistant Secretary, McGraw-Hill Publishing Company, 330 West 42d Street, New York 18, N.Y.

• 1926 •

Our Class had a goodly turnout at the December banquet of the M.I.T. Club of New York, which the Secretary also had the pleasure of attending. Among the many classmates present were: Allen Bassett, Wilbur Criswell, Larry Cumming, Wicks Eddy, Raymond Freeman, Anthony Gabrenas, Jay Goldberg, Mal Hird, Ed Huckman, Don King, Bill Latham, George Leness, Dan McGrew, George Makaroff, Dudley Parsons, Dick Pough, Benny Richardson, Ed Stallman, Jimmy Walker, and Earl Wheeler.

Announcement was made recently in the Bridgeport, Conn., *Herald* that our classmate, W. Robert Dresser, in association with Fred Waller of Vitarama Corporation, is about to launch a new movie projector system that was turned over to the United States during the War for use in aerial gunnery training. Instead of a small screen on stage as at present, the Dresser-Waller method will show action in an enormous sphere that surrounds the audience. Five projectors and a number of high fidelity loud-speakers are part of the new system. The development is the result of more than 20 years of research in radio and motion-picture engineering by Dresser, who is owner and operator of the Audio-Tone Oscillator Company and previously was research and development engineer for Paramount Pictures.

George Edmonds, the newly elected president of the Wilmington Trust Company in Wilmington, Del., attended the meeting in Cambridge of the M.I.T. Committee on Financing Development. In addition to his banking posts, George is involved in a number of industrial activities and has been a member of the

Republican National Committee. Another resident of Wilmington is Sam Homsey, who practices architecture there in partnership with his wife. Sam recently had a one-man show of water colors at a Boston gallery which prompted much favorable comment. One of his water colors was acquired by the Boston Museum of Fine Arts.

In the Secretary's mailbag within recent weeks have been letters from Hump Barry, who is with the Universal Atlas Cement Company in New York; Charlie Bianchi, a partner of Cohu and Company, also of New York; Sam Cole, a member of the Real Property Review Board of the War Assets Administration in Washington; Nat Gada of General Electric in Syracuse; Bill Hinckley, engineer for Cherry-Burrell's New England branch in Boston; Howard Humphrey of the Nylon division of E. I. du Pont de Nemours in Wilmington; Alan Laing of the architecture faculty at the University of Illinois; Ray Mancha, vice-president of the Joy Manufacturing Company in Pittsburgh; Bill Sessions and Dick Whiting, Cleveland and Washington patent lawyers, respectively; and Don Chase, sales manager of the rubber and plastic division of the Farrel-Birmingham Company in Ansonia, Conn., who writes: "Possibly you are not acquainted with our equipment, but we make a high percentage of the heavy equipment used in the rubber and plastic industries, including the Banbury mixers, Gordon plasticators, calenders, mills, presses, and so on. This equipment is used world wide, and in June of last year I made a flying visit to England and France. . . . I run into George Smith occasionally, see George Apel of Boston Woven Hose frequently, and see Larry Randall and John Oakley out at Goodyear. . . . My two boys, David, 11, and Richard, 13, are growing up fast."

John Burgess Coleman has returned to academic life. His appointment as associate professor of electrical engineering was announced last fall by Chancellor Samuel P. Capen of the University of Buffalo. For four years after receiving his master's degree at the Institute, Coleman was an instructor in our Department of Electrical Engineering. Thereafter he was, successively, vocational director at the Saco-Lowell Shops, civilian radio engineer for the Signal Corps, chief engineer for the Radio Condenser Company, and, most recently, chief engineer for the Decatur Pump Company. — Irvin L. Murray has been elected to the board of directors of the American Institute of Chemical Engineers. He has been with Carbide and Carbon Chemical Corporation in Charleston, W. Va., since 1927 and became chief process engineer in 1943 upon his return from Russia, where he had served with the American rubber mission. — The Rev. Arthur J. Riley has been appointed chaplain of the Plymouth Council, Knights of Columbus.

Richard Parsons of Hingham is the new manager of the Quincy Electric Light and Power Company. Another classmate in the public utilities field is Frederick Bahr, who has become superintendent of the Public Service Electric Gas Company in Hackensack, N.J. Bill MacQuarrie has been transferred by Electric Storage Battery from

San Francisco to Philadelphia and is living in Glenside, Pa. Horace Bush, formerly with McLeod Leather Belting Company, is now an investment analyst with National City Bank in Cleveland. — JAMES R. KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

• 1927 •

We regret to advise you of the death of Carleton Norton '29 on November 19. He was operator and manager of the Loomarwick Hotel, Lake Waramaug, New Preston, Conn., and was originally employed by the hotel in 1928. He was very active in civic affairs and was an officer of the Connecticut Hotel Association. A letter from Ken Beckley tells that Bus died very suddenly and that he and Bus and their wives had spent election night together at Ken's home in New Milford. We offer our deepest sympathy to Mrs. Norton.

Marvin H. Dixon, who is with the St. Regis Paper Company at 230 Park Avenue, New York City, is engaged to Caroline Hiatt of Hinsdale, Ill. Miss Hiatt is an alumna of the University of Chicago and curator of manuscripts at the Princeton University Library. — After 17 years with the U.S. Finishing Company, Glenn Jackson has switched to the N.C. Finishing Company and will move to New York, hoping for a house in Summit, N.J. Glenn was vice-president of the M.I.T. Alumni Association of Rhode Island and still retains a healthy interest in its activities.

I again bumped into Deke Crandell in Rockefeller Center, his address is still 175 Berkeley Street, Boston, and he gave me the following briefs on several of our classmates: Fred Byron lives in Needham and is a contractor specializing in floors for bridges. Johnny Boyle lives in Boston and is a constructor superintendent working primarily on water supply and well problems; he is a partner in his firm. Steam Harrison was a lieutenant commander during the War but now lives in Shrewsbury and is in the oil business with offices in the Park Square Building in Boston. Bill Richards, who was goalie on Deke's hockey team, is a mass production farmer near Camp Edwards, Mass. I have Deke's word for it that during the busy season Bill ships 6 tons of lettuce per day to the market.

The following quotation from the Boston Herald will give you the up-to-date news on one of our classmates: "There were five slots in the glass show window like the openings at the bottom of ticket-sellers' windows and sticking out onto Washington street were about ten pieces of men's suiting coming from bolts of cloth standing on end in the window. Bolted to chains were five pairs of scissors, also dangling outside the window. In front of the window stood a crowd of people, fingering the goods and cutting off swatches. 'What won't they think up next?' remarked a chap as he snipped off a generous hunk and tucked it into his vest pocket. Inside the store, which turned out to be a combination clothing store and garment factory occupying the former Red Cross headquarters and called the Richard Clothing Mfg. Co., it was developed that this free swatch stunt was the invention

of the owner of the outfit, a tall MIT graduate named Harry Franks."

John Herlihy, who is vice-president, Operations, of United Airlines, has moved his headquarters from Chicago to Stapleton Airfield, Denver, Colo., where he will be located more closely to the center of his airlines' operations; and where the hunting and fishing are very good. — A brand new merchandising idea attributed by the New York News Record to Ben Levinson, who is owner of the Duralaun Metropolitan Distributors, Inc., involves the sale of men's shirts by a laundry in the metropolitan area and is the first step in a plan to offer clothing for sale through laundries on a nation-wide basis. Three shirts are sold for \$11.89.

We were very glad to receive the following from George Houston, whose address is 2309 Almeria Road, Schenectady: "I went to Richland, Wash., in December, 1943, with DuPont when they were building the town and stayed on there with General Electric when the company took over the operation in September, 1946. As you can guess there were a lot of combined hard work, experience, fun, and friendship packed into those years. My work in the management of the community was exceptionally interesting, in fact, never a dull moment. However, I'm not going to write a book about it, right now anyway. Crossed paths with quite a few good Technology men there. As of September 1 this year, I was transferred to a new assignment with General Electric here in Schenectady. I am on the methods and procedures staff of the apparatus department getting myself involved in what is essentially management research work. I am extremely pleased with the setup; to say nothing of being closer to old friends in the East with a chance to sneak over to the Maine Coast on vacations." — JOSEPH S. HARRIS, *General Secretary*, Shell Oil Company, Inc., 50 West 50th Street, New York 20, N.Y.

• 1930 •

We start the new year with word from Bob Nelson that our Class is represented on the Committee for Financing Development by 11 men. Jack Bennett, Chuck Ladd, and Bob were present at the committee's first meeting at the Institute in November. En route east with his wife, Bob visited in Cleveland with the Wigglesworths, all four of them attending the first mixed dinner of the M.I.T. Association of Cleveland. Tom has a very promising machinery business there. Bob makes the timely suggestion that 1930 hold a class get-together in Boston around the first of April at the time of President Killian's inauguration. — Hermon Scott and his wife spent five weeks in England, France, and Switzerland last fall on a combined business and pleasure trip. Dave Bannerman has returned from Japan where he was on a special assignment for the American Bureau of Shipping. John Worcester is back in this country again after spending several years mining in Bolivia. Ed Kingsley has been named general manager of John H. Pray and Sons Company in Boston, one of the city's best-known rug and

home furnishings stores. In Waltham, Mike Fenton has been promoted to the position of works manager of the Waltham Watch Company. While doing work at Harvard in conjunction with the restoration of an abbey in Limoges, France, Dr. Ferdinand Rousseve is serving as a special lecturer at Boston College. Last September he was the recipient of the Hoey Award for his outstanding contributions to the cause of interracial justice. Ed Nolan is the new Rahway plant manager for Merck and Company.

We are pleased to announce the engagement of Dan Hughes to Gladys deFreitas of Middletown, N.Y., and that of Morris Young to Chesley Barnes of Hamburg, Ark. Morris is a staff member of the New York Postgraduate Hospital and Medical School. — The Starratts are the proud parents of a daughter, born the day before Alumni Day last June. The only 1930 men to whom your Secretary could offer cigars at the Alumni Dinner were Jack Latham and Scotty. We hope to see a good turnout of our classmates at the midwinter meeting of Greater Boston Alumni on February 5, for which George Shrigley is the chairman. — PARKER H. STARRATT, *General Secretary*, 1 Bradley Park Drive, Hingham, Mass. *Assistant Secretaries*: ROBERT M. NELSON, 2446 Iroquois Road, Wilmette, Ill., ROBERT A. POISSON, 105 East 88th Street, New York 28, N.Y.

• 1932 •

Don Gilman has been active since our reunion a year ago last June on the subjects of a class history and a class gift. Progress is being made and the details will be covered in direct mailings to all members of the Class. Joseph Welch, Jr., has accepted the position of chairman of our permanent class gift committee and will be expecting your full co-operation.

John Finnerty of Brookline is engaged to Dorothy Ann Linehan of Peabody. Ebed Lincoln Ripley of Hingham is engaged to Louise Swallow of Manchester, N.H., and an early spring wedding is planned. Agnew A. Talcott of Darien, Conn., was married in October to Shirley Yoakum Whitney of Garden City, N.Y. — John F. Strickler, Jr., was appointed assistant executive chief engineer of Bell Aircraft Corporation of Buffalo, N.Y. From this announcement we also learn that John has two boys and a girl. Kurt J. Heinicke has been appointed manager of the scientific instrument division of Ward's Natural Science Establishment, Inc. He had been with Bausch and Lomb since 1936 in the instrument development department. Last May, Tom Jenkins joined Stanolind Oil and Gas Company in their producing department, general office, Tulsa, Okla. F. R. Morral has accepted the appointment of associate professor of materials engineering at Syracuse University. During the last four years he was associated with the research laboratories of the American Cyanamid Company. — CLARENCE M. CHASE, JR., *General Secretary*, 1424 East 7th Street, Plainfield, N.J. CARROLL L. WILSON, *Assistant Secretary*, United States Atomic Energy Commission, Washington 25, D.C.

• 1935 •

During the midwinter meeting of the American Chemical Society which was held at the Institute between Christmas and the New Year, Henry J. Ogorzaly dropped into The Review office for a brief chat. It is from Hank that we learned of the distressing news that Wilfred R. Grosser was stricken with infantile paralysis about three months ago and has been confined in the Jersey City Memorial Hospital where he has been undergoing Kenney treatment. It is reported that Wil was stricken while remodeling a house he had recently bought at Hillsdale, N.J., where he lives with his wife, Ruth, and their two children. We are happy to report, however, that Wil is making good progress in his recovery, and that he was able to return home for family reunions during the Thanksgiving and Christmas holidays. The entire Class joins in expressing their best wishes for a speedy recovery. For a few years after graduation, Wil was engaged in ship design but turned to teaching engineering at the Brooklyn Polytechnic Institute and a few years ago became associated with the Standard Oil Company of New Jersey. — Hank Ogorzaly is still with the Standard Oil and Development Company in Elizabeth, N.J., where he continues to make good use of the chemical engineering to which he was exposed while a student at the Institute. The Ogorzaly family, which now includes two children, Clayton and Catherine, live at 227 Mountain Avenue, Summit, N.J.

Announcement has been received that John R. Burton, Jr., has become affiliated with Draper, Perkins, and Associates, Inc., 66 Beaver Street, New York 4. This firm engages in printing and publishing and specializes in corporate records, public relations literature and similar matters. For the record, the announcement recalls that Burton is not only a graduate of the Institute and of the Harvard Business School, but was a colonel in the Army's Ordnance during World War II, and that he also served as former advisor in the Department of State and as a bank officer. — Robert A. Olsen, of 97 Mayflower Road, Needham, is an industrial engineer at the Jordan Marsh Company in Boston. He has recently been appointed an instructor in scientific management in office practice at the Northeastern University Evening School of Business, and began his teaching career in September. — J. BARTON CHAPMAN, *General Secretary*, 7 Lally Boulevard, Fairfield, Conn.

• 1937 •

Let's start with the news flashes: Ed Bartholomew, II, III, is now an assistant professor at the Institute, Room 35-157; Chester Brown, Jr., is now a major in the Army; Jim Ewell has moved from Milton, Mass., to Camargo Road, Cincinnati, Ohio; George Hain '36 also moved to Cincinnati from Montclair. George's address is Apartment 1, 4211 Allendorf Drive, Cincinnati 9, Ohio; Paul Johnson has gone south to 267 Midvale Drive, N. E., Atlanta, Ga.; John P. Mather has returned to the East from Chicago. His new address is 50 Travis Road, Natick, Mass; Rolf Schneider

is now at Corning, N.Y., with the Corning Glass Company; Bill Wold is with Convair, 40 Wall Street, New York City.

It was good to see Bill McCune's picture in a November issue of *Business Week*. Bill in turn was snapping a picture of a pretty girl with Polaroid's new "you snap the shutter, we do the rest" camera. — Jack Robbins is expecting an addition to his family as we go to press. Jack is home at 136 Russell Road, Fanwood, N.J. — Bill Burnett tells me that the long lost Jim Newman has written that he is with Booz, Allen, and Hamilton, 135 South LaSalle Street, Chicago. He is in charge of personnel. Windy and I hope you silent classmates deluge us with news; it's sparse, boys, to sparse. — WINTHROP A. JOHNS, *General Secretary*, 34 Mali Drive, North Plainfield, N.J. WALTER T. BLAKE, *Assistant Secretary*, Research Products Development Division, Pillsbury Mills, Inc., Minneapolis, Minn.

• 1938 •

On November 8, Kitty Ward became engaged to Irwin Freyberg in New York. Later that same week the engagement of Elizabeth R. Cocke to Dave Wright was announced. Dave is president of the Lake Tankers Corporation. On October 23, in the Larchmont Avenue Presbyterian Church in Larchmont, N.Y., Sue Louise Heath, daughter of Mr. Donald Read Heath, United States Minister to Bulgaria, and Mrs. Heath, became the bride of Frank William Brown, 3d, lieutenant commander, U.S.N. Frank is in the radiation laboratory of the Naval Shipyard in San Francisco, and to add '38 atmosphere at the wedding, Welles Wothen was the best man. Then, on November 9, in Brookline, Virginia Black was married to Richard DeLong. They are now living in Buffalo. — On November 11, Mary Jane Atwater was born to Marion and Franklin Atwater at the Hartford Hospital.

For those of you who are keeping track of Bill Gibson, he is now at the American Embassy in Rome. Given Brewer has been commissioned a captain in the Marine Corps Reserve. Ralph Lebow is with the Power Plant Laboratory of the Air Materiel Command at Wright Field working with the problems associated with the installation of engines in all the different types of aircraft that the Air Forces are using or procuring. Clark Robinson is a professor at the University of Illinois in the department of physics and has been working on a 75 million volt betatron. Finally, Don Weir is now in business for himself doing business as "California Camera," 9042 Wilshire Boulevard, Beverly Hills, Calif. He has a photographic store and offers a complete sales service of developing, enlarging and printing. Best of luck, Don. — A. O. WILSON, JR., *General Secretary*, 32 Bertwell Road, Lexington 73, Mass.

• 1940 •

Roy W. Prince, Jr., has joined the American Newspaper Publishers Association as head of the mechanical research laboratory at Easton, Pa. He will take charge of the laboratory and handle all

field testing. During the War Mr. Prince was associated with the National Defense Research Committee, working with the research laboratory at the Institute under contract for the government. He left the Bell Telephone Laboratories where he was engaged in research work to join the American Newspaper Publishers Association. — William F. Meany, lieutenant colonel, U.S.A., has been assigned ordnance officer for the United States forces in Austria and is stationed in Vienna. Colonel Meany recently completed studies at the Harvard Business School and was a member of our Class following his graduation from the United States Military Academy, class of 1936. During World War II he served with Headquarters, Fifth Army Air Force, from May, 1944 through May, 1945, in New Guinea, the Philippines, Owi Island, and Leyte. He was awarded the Soldier's Medal, the Pacific ribbon with four campaign stars, National Defense and American Theater ribbons, the Victory Medal and the Philippines' Liberation ribbon with one star.

We understand that John Quady and William L. Davis, Jr., both with the Emerson Electric Manufacturing Company in St. Louis, have been tinkering with an invention for the past seven years which has recently been patented. They have a helicopter-type ship which converts into a regular airplane when it has altitude, with all the maneuverability and thrust of a fast aircraft. Apparently, the two have solved the problems involved so well that the Navy is building one right now. It would mean a great deal to Navy fliers if they could land a fast fighter on the flight deck of a carrier without effort or hazard. — Charlot K. Arnoldy was married to Donald W. Ross on October 23. Mr. Ross, since his discharge from the Army in 1945, has been employed by the Hartford Accident and Indemnity Company as a special agent in the eastern New York territory. — H. GARRETT WRIGHT, *General Secretary*, Garrett Construction Company, Main Post Office Box 629, Springfield, Mo. THOMAS F. CREAMER, *Assistant Secretary*, 6 Berkley Road, Scarsdale, N.Y.

• 1941 •

Word from Will Mott tells of the arrival of Linda Mott to augment the Will-Charlotte combine of senior prom days. Doris and Elmore Pillsbury are boasting about daughter Sylvia. Elizabeth Carr recently became Mrs. Ben Duffy. Wei-Pang Han is in Hankow, China; Shen-Pai Hua in Shanghai, China; Irv Goldberg in Hamilton, Canada; Mrs. William Haskell in Santos, Brazil; and Hoadley Mitchell is with the Horton Cedar Manufacturing Company, Ltd., in Victoria, British Columbia, Canada. Loren Brunner, a commander, in Washington, D.C.; Ted Fabik, also a commander, at the Coast Guard Academy in New London; Irv Koss, a captain with an A.P.O. number out of San Francisco; and Paul Huber, a major with an A.P.O. number out of New York.

A number of the lads have settled out on the West Coast. They include: John Allen at Hermosa Beach, Dave Jacobson at Glendale, John Stern at Palo Alto, Charlie Core at Santa Monica, Ruddy

Hensel at Altadena, Alex Poskus at Stanford University, Ed Sumner at Pasadena, and Gifford White at Beverly Hills; all in California. Gifford, by the way, is with the Statham Laboratories. Phil Purdy is in Olympia, Wash. Down South we find: Fred Came in Memphis, Tenn.; Rog Allen in Arlington, Va.; John Clark in San Marcos, Texas, with the J. Clark Industries, Inc.; Terence Pollard in Dallas, Texas, Mason Miller in Hampton, Va.; Howard Dilts in Lake Jackson, Texas, and Ed Hardway in Sandston, Va. Among the westerners are: Don Gillies, Jack Klyce, and Frank Gandola in Ohio; Joe Dietzgen, Jim Tyson, and Lowell Schoenfeld in Illinois; El McGee and family have recently settled in St. Paul, Minn.; Bill and Ruth Cadogan are in Whiting, Indiana, where Bill is with the research department of the Standard Oil Company, having just finished his doctorate at the Institute; Crosby Baker is in Denver, Colo.; Warren Meyers and his new bride, Cynthia, are in Ludington, Mich.; Louis Minbiole is in Flint, Mich.; Conrad Nelson is with the Air Force at the Sandia Base in New Mexico; and Ted Walkowicz is at the Air Force Headquarters in Washington, D.C.

That is all for now fellows. We would appreciate hearing from all who have not written within the last year. — **STANLEY BACKER**, *General Secretary*, 101 Providence Road, Primos, Pa. **JOHAN M. ANDERSEN**, *Assistant Secretary*, Saddle Hill Farm, Hopkinton, Mass.

• 1943 •

The former Rose Mary Johnson and Larry Stewart were married in Los Angeles on December 26. Larry graduated from the Harvard Business School last year. Bernard Reckseit and Joan Lorna Fleischer were married at the Losantiville Country Club near Cincinnati on November 6. Bernard's bride is a graduate of Vassar, and later became a graduate student at Columbia. The couple will spend about a month motoring in Mexico, and will then return to their new home on Glen Ridge Place in Cincinnati. In Lawrence, Mass., on October 24, Marjorie Marie Lenane and Chris Matthew were married in St. Lawrence Church. The new Mrs. Matthew is a graduate of the Fay School in Boston. The Matthews spent their honeymoon on the West Coast and returned home to Woburn Street, Andover, Mass. Chris is with the Arthur D. Little Company in Cambridge. In Newton, Mass., on October 23, the former Sarah Hall and Lewis Johnson were married. Bill Lacy was one of the ushers. The couple spent their wedding trip at Hot Springs, Va., and are now living in Pittsburgh.

Among the changes of address which have been forwarded to me recently I note that Hans Wohlwill is at the California Institute of Technology. Herb Twaddle, who is with the Virginia-Carolina Chemical Company has moved to Richmond, Va., from Ossining, N.Y. Lewis Lipschutz has left the Institute and has returned to Rockaway Beach, N.Y. Ray Mork has moved from Cincinnati to Newton, Mass. I have heard also that Felipe Echaniz, who is with the Frederick Snare

Corporation, has moved from Washington, D.C., to Caracas in Venezuela. — **CLINTON C. KEMP**, *General Secretary*, 29 Verlynn Avenue, Hamilton, Ohio.

• 1944 (2-44) •

After talking with many members of our Class, the officers felt that it would be desirable to hold a five-year celebration similar to that held by other classes of the past several years. This consists of having a dinner and suitable entertainment and refreshments in the Campus Room of the Graduate House on the evening before Alumni Day. The Campus Room has been reserved, thanks to the quick thinking of Mal Kispert, and it is planned to hold the affair on Friday, June 10, 1949. Plans for the program are not yet definite, and any suggestions from members of the Class will be very welcome. It is hoped that somewhere between 100 and 150 members of the Class of 1944 will find it possible to attend this affair.

There will be a short business meeting of the Class and probably the most important item for consideration will be that of inaugurating a class insurance program similar to that organized by preceding classes. Other classes of the Institute which have inaugurated insurance programs have set as their objective a \$50,000 or \$100,000 gift to the Institute on their 25th reunion. If we are to accomplish this, it seems desirable that we should start immediately after our five-year reunion and make the insurance policies 20-year payment policies. The program which seems to have the most appeal to Alumni is that of the subscriber's designating his beneficiary for the period before the 25th reunion. At the 25th reunion all subscribers to the class insurance program automatically make the Institute the beneficiary of their paid-up insurance policies. To give you an idea how much money is involved, it has been estimated that a 20-year payment \$1,000 insurance policy, taken out at the age of 27 years, will cost about \$33 per year for the 20-year period. There is no reason why subscribers cannot take out any part of the \$1,000 policy if they so desire. This then presents a problem with which the Class is confronted, and we hope that you will give it careful consideration and make any comments or criticisms which will be helpful.

Beverley Tucker has moved to Dallas, Texas with the Chance Vought Division of United Aircraft where he is a production co-ordinator. — **WILLIAM B. SCOTT**, *General Secretary*, Mellon C-41, Harvard Business School, Boston 63, Mass. **MALCOLM G. KISPERT**, *Assistant Secretary*, Room 3-208, M.I.T., Cambridge 39, Mass.

• 1946 (2-46) •

Sometime early in September, Cy Olsen married the former Faye Olsen of Lincolnwood, Ill. A picture accompanying the newspaper clipping showed a very handsome couple. Jonathan A. Sisson, ensign, U.S.N., and Shirlee M. Vaughn of Hilton Village, Va., and Chicago were married in Annapolis, Md., on October 10. Gene Parish and Harriet A. Dinsmoor of Newton were married on October 9. Classmates

Bob White and Louis Martin attended Gene as best man and usher, respectively.

Recent engagement announcements include those of Noel Coe and Barbara A. Simmons of Boston, Jim Goldstein and Rosanne Greene of South Orange, N.J., Bob Taylor and Clare Cochran of Wallingford, Pa., John Green and Elsie Daansen of Sea Breeze, N.Y., and Don Robison and Margaret A. Waters of New York, N.Y. — The brevity of this report may be explained by the fact that class president Herb Hansell and your Secretary have been preparing a complete (we hope) documentary covering the entire Class which should reach you shortly. — **JAMES S. CRAIG**, *General Secretary*, 387 Harvard Street, Cambridge 38, Mass.

• 1948 •

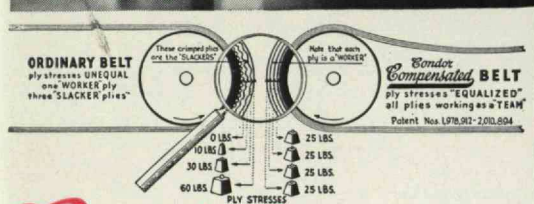
The engagements for this month include: Jane Oakley of Simmons College to Robert Nutter; Peggy Harris of Randolph-Macon Women's College to Jerry Lott; Nancy Richards of Connecticut College to James Manson; Mary Sue Bee of Bradford Junior College and the Garland School to James Leahy; Lois Adelle Dean, a Wellesley girl, to Tom Buck; Margaret Ann Ellis of Bradford Junior to Charles Butter; Pat Thayer of Vassar College to Russ Stevens; and Mary Ann Lane of the College of New Rochelle to Tom Kelly.

The marriages reported to us are only slightly less numerous than engagements and include the following: Marjorie House, a Technology alumna, to Hayden Field Loveland, who is a student at Trinity College; Virginia Frances Simons to Ensign Robert L. Vader in Washington, D.C.; Marie Ann Tremblay to Jack Donahue in Cambridge; Alta Wilson to Walter Moore in Fall River, Mass.; Nancy Lofgren to Vincent Vappi in Forest Hills, Mass.; Nancy Greene to John Hawkins in Edgewood, R.I.; Marjorie Cramton to Jay Lathrop in St. Johnsbury, Vt.; and Beatrice Cook to Donald Perkins in Melrose. The only birth to report this month is a daughter, Christine Ann, to Robert and Mrs. Carbee.

George Fountas is working at the Army Chemical Center in Edgeworth, Md. James Keenan is doing the same. Herman Carlson has taken an engineering job with the Boston and Maine Railroad; John Lamarsh is doing graduate work at Technology; Al Baum is with Merck and Company; and J. C. Ray has taken up premed studies at Texas Christian University. Greta Backer spent the summer in Europe and is now studying music at the New England Conservatory. Joe Yance, representing John Wiley, the New York publishing house, and Skip Justin, of Chase Copper and Brass, met in St. Louis and discussed what they like about the Middle West. They came East together in December.

Your classmates and friends from Technology would like to know what you are doing and where you are doing it. Please get out the pen and ink and keep us informed about yourself. — **WILLIAM R. ZIMMERMAN**, *General Secretary*, M.I.T. Graduate House, Cambridge 39, Mass. **RICHARD H. HARRIS**, *Assistant Secretary*, 263 Harvard Street, Cambridge 39, Mass.

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"COMPENSATED"
Really Counts



Condor's Compensation Principle

... Prolongs the Life of This Belt

This 16" Condor Compensated Belt is operating the main drive in a large southern lumber mill. Note the two large idler pulleys are putting considerable strain on this belt. However, when the photo was taken, this Condor Belt had already been in service 3 years. The pleased owners reported,

"This belt has outworn all others and looks good for at least three more years."

On lumber mill drives, factory line shafts, big pumps, generator drives, etc., Condor Compensated Belts "outwear the field", because they are engineered for equalized ply stresses.

In regular belt construction, the outer plies take ex-

cessive strain when flexed over pulleys. The inner plies "relax" as the inset shows. Condor's Compensation Principle insures equal pull in every ply regardless of size of pulleys or load and tension. Make Condor Compensated your choice for drives demanding extra belt strength and long service.

Manhattan offers a range of four driving tension surfaces on rubber transmission belts. Also Endless Cord, Non-Spark, Oil-Proof and Acid-Proof constructions. Belts can be factory-made endless or field vulcanized by the Condor-Weld method. All Manhattan endless belts have the patented Extensible-Tip outer-ply splice which prolongs belt life 3 to 10 times. Literature on request.



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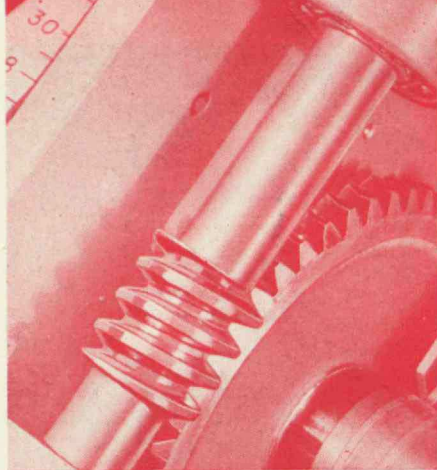
Thomas H. Boyd, '23

Wilder E. Perkins, '25

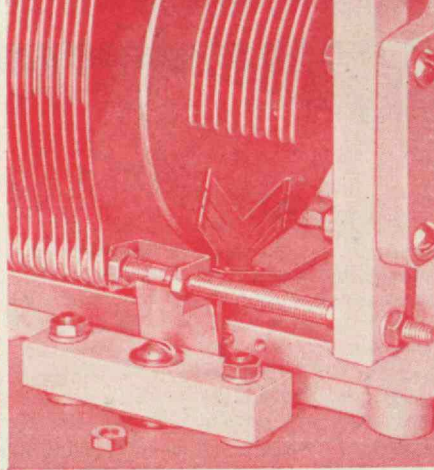
Charles P. McHugh, '26

Daniel J. Hanlon, '37

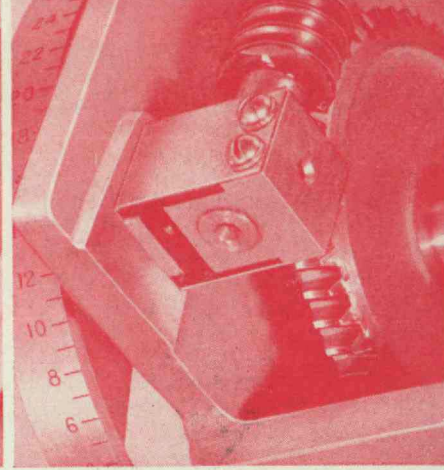
Albert W. Beucker, '40



This 50-to-1 worm drive, equipped with a 3 1/2 inch dial, is used for the fine setting adjustment. Backlash is kept very low by spring pressure on the worm shaft. Eccentricity from set screws and misfit is eliminated by cutting the worm and its shaft from an integral steel shafting.



Two small, waxed steatite bars insulate the stator plates. A Figure of Merit (Dissipation Factor x Capacitance) of 0.04 μmf is secured (0.003 μmf with quartz insulators). Connection to the rotor is through spring-tempered silver alloy brushes bearing on a silver-overlay brass disc.



The worm shaft is held to a tolerance of 0.0004 inch; radial eccentricity of the worm gear is less than 0.002 inch. The main rotor shaft is held to a tolerance of 0.0005 inch and its bearing surfaces to 0.0002 inch. Ball bearings are used on worm and main rotor shafts.

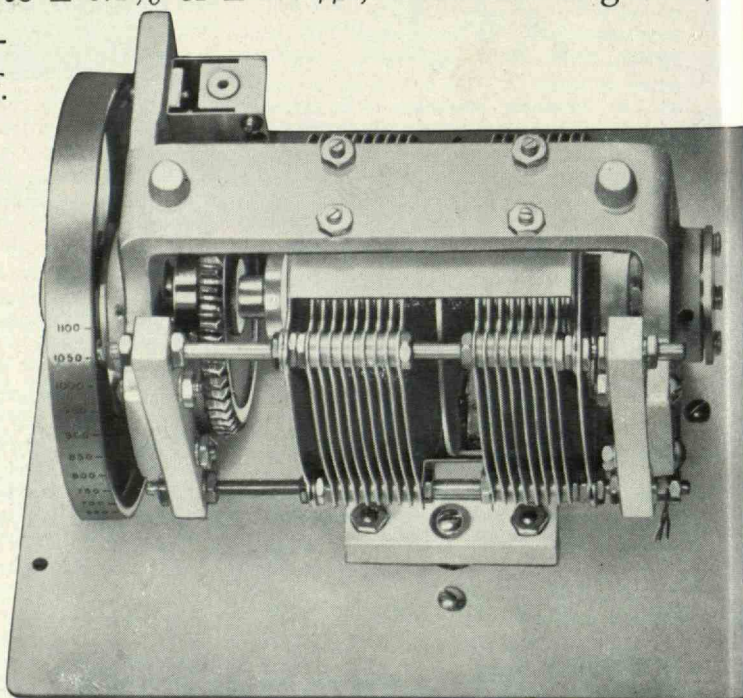
The STANDARD of Variable Capacitance

Recently the accuracy of the well-known G-R Type 722 Precision Condensers has been increased, making these standards of variable capacitance of even greater use in the laboratory and as the variable element in many instruments such as oscillators and frequency meters.

Typical of the three different models of this condenser is the Type 722-N, with extra low metallic resistance and inductance. This condenser (illustrated) is direct reading to $\pm 1 \mu\text{mf}$. When the corrections (charted on the front panel) are applied to the direct-reading settings the accuracy is increased to $\pm 0.1\%$ or $\pm 0.4 \mu\text{mf}$, whichever is greater, and the corresponding accuracy for capacitance differences is $\pm 0.1\%$ or $\pm 0.5 \mu\text{mf}$.

SPECIFICATIONS

- **CAPACITANCE RANGE:** 100 to 1100 μmf , direct reading
- **STANDARD CALIBRATION:** Direct reading in μmf at 1 kc to $\pm 1 \mu\text{mf}$. Mounted correction chart gives corrections to 0.1 μmf at multiples of 100 μmf .
- **WORM CORRECTION:** For very precise measurements a worm correction calibration can be supplied. When these are applied capacitance can be determined within $\pm 0.1 \mu\text{mf}$ or $\pm 0.1\%$, whichever is greater, and capacitance differences to $\pm 0.2 \mu\text{mf}$ or $\pm 0.1\%$
- **METALLIC RESISTANCE:** Series resistance about 0.008 ohm at 1 Mc
- **SERIES INDUCTANCE:** Approximately 0.024 μh
- **TEMPERATURE COEFFICIENT:** Approximately 0.002% per deg. C.



- **TYPE 722-N PRECISION CONDENSER** \$160
- Worm Correction Calibration 50
- Quartz Insulation 85



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